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Xeroderma Pigmentosum.

(From a painting in oil.)

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A PRACTICAL TREATISE

ON

DISEASES OF THE SKIN

FOR THE USE OF

STUDENTS AND PRACTITIONERS

BY

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TO

JAMES CLARKE WHITE, M.D.

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FIRST PRESIDENT OF THE AMERICAN DERMATOLOGICAL ASSOCIATION

AND PRESIDENT OF THE
SIXTH INTERNATIONAL CONGRESS OF DERMATOLOGY

THIS TREATISE IS

WITH HIS PERMISSION INSCRIBED

PREFACE TO THE EIGHTH EDITION

The untimely death of the lamented Dr. Frank Hugh Montgomery, who was associated with the author in the production of the preceding three editions of this treatise, temporarily interrupted the work of preparation for the present revision. In this emergency the author acknowledges his great indebtedness to his associate, Dr. Oliver S. Ormsby, for valuable aid not only in the preparation of manuscript but also in the labor incidental to the correction of proof. The author desires to express also his special appreciation of the value of the services rendered by his colleague, Dr. E. L. McEwen, in the same double capacity; and to Dr. Henry G. Anthony of the Dermatological Staff of the College, for correction of a part of the text.

Every line of the last edition has been carefully revised with a view to improvement of the work, and it has been found necessary to add 250 pages in order to ensure a complete presentation of the subject in its latest developments. In view of their growing importance to practitioners of medicine, the Diseases of Warm Countries and the Tropics have here been considered in a separate chapter; and for reasons of equal weight, the affections of the Nails and the Dermatoses affecting the Mucous Surfaces have also been grouped together in separate chapters. New articles have been written on the following subjects: Prurigo Nodularis, several of the special forms of Erythema, the Fourth Disease, Paraffin Prosthesis, Osteoma and Calcification of the Skin, Meralgia Paræsthetica, Acrodermatitis Pustulosa Hiemalis, Lichen Spinulosus, Keratolysis Exfoliativa Congenita, Lipoma, Fordyce's Disease, Causalgia, Leukæmia and Pseudo-leukæmia Cutis, Tinea Ciliarum, and, in particular among the disorders produced by animal parasites, the important subject of Brown-tail Moth Dermatitis.

The author desires also to express his grateful thanks to his dermatological friends in different parts of this country and abroad for permission to illustrate the text with portraits of interesting and rare dermatoses, many of which have not been heretofore published. Dr. John A. Fordyce, Dr. George Henry Fox, Dr. Howard Fox, and Dr. A. D. Mewborn, of New York; Dr. Douglass W. Montgomery and Dr. Howard Morrow, of San Francisco; Dr. E. E. Tyzzer of Cambridge, Mass.; Dr. Stopford-Taylor of Liverpool; Dr. M. L. Heidingsfeld of Cincinnati; and Dr. David Lieberthal and Dr. Herman Spalding, of Chicago, have in this way contributed largely to the value of the edition. In connection with the author's original collection it has thus been possible to add 24 new plates and 120 new engravings.

The author indulges the hope that the unstinted labor bestowed in the revision and improvement of this edition may increase its usefulness both as a text-book and as a practical work of reference.

The reader is again reminded that in detailing the amount of drugs ordered in the separate prescriptions, the metric figures are not literal translations of the accompanying quantities given in apothecaries' weight, but are frequently metric formulas of approximate value.

After more than twenty-five years in association with the honored firm of publishers, the author takes pleasure in acknowledging his appreciation of their unfailing and courteous coöperation.

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ABBREVIATIONS EMPLOYED IN THE WORK.

- Annales: Annales de Dermatologie et de Syphiligraphie, Paris.
Archiv: Archiv für Dermatologie und Syphilis, 1869-73; and since 1889.
B. J. D.: British Journal of Dermatology, London.
Centralb.: Dermatologisches Centralblatt, Leipzig.
Giorn. ital.: Giornale italiano delle malattie veneree e della pelle, Milan.
J. C. D.: Journal of Cutaneous and Venereal Diseases, 1882-87; Journal of Cutaneous and Genito-Urinary Diseases, 1888-1902; Journal of Cutaneous Diseases, including Syphilis, since 1903, New York.
Jour. mal. cutan.: Journal des maladies cutanées et syphilitiques, Paris.
Monatshefte: Monatshefte für praktische Dermatologie, Hamburg.
Vierteljahr.: Vierteljahresschrift für Dermatologie und Syphilis, 1874-88.
Zeitschrift: Dermatologische Zeitschrift, Berlin.
Brit. Med. Jour.: British Medical Journal, London.
J. A. M. A.: Journal of the American Medical Association, Chicago.
Allbutt's System: A System of Medicine by Many Writers, edited by T. C. Allbutt, New York, 1901.
American Text-book: An American Text-book of Genito-Urinary Diseases, Syphilis, and Diseases of the Skin, edited by L. Bolton Bangs and W. A. Hardaway, Philadelphia.
Besnier's and Doyon's Notes: Besnier's and Doyon's notes in their French translation of Kaposi's treatise.
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Kaposi, Diseases of the Skin: Pathologie und Therapie der Hautkrankheiten, ninth edition, 1899.
La Pratique Dermatologique: La Pratique Dermatologique, Traité de Dermatologie appliquée, edited by E. Besnier, L. Brocq, and L. Jacquet, Paris, 1900-1902.
MacLeod Pathology: Practical Handbook of the Pathology of the Skin, by J. M. H. MacLeod, London and Phila., 1903.
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Morrow's System: A System of the Genito-Urinary Diseases, Syphilology, and Dermatology, edited by Prince A. Morrow, New York, 1894.
Mraček, Handbuch: Handbuch der Hautkrankheiten, edited by Franz Mraček, Vienna, 1901-1903.
Scheube, Diseases of Warm Countries: Diseases of Warm Countries, by B. Scheube, translated by Pauline Falcke, edited by James Cantlie, Phila., 1903.
Stelwagon, Diseases of the Skin: Treatise on Diseases of the Skin, Henry W. Stelwagon, Phila. and London, 1907.
Twentieth Century Practice: Twentieth Century Practice of Medicine, edited by Thomas L. Stedman, New York, 1896.
Unna, Histopathology: The Histopathology of the Skin, P. G. Unna; English translation by Norman Walker, Edinburgh and New York, 1896.



I. ANATOMY AND PHYSIOLOGY OF THE SKIN.

THE skin is the living envelope of the human body; it is closely associated with underlying structures, and by its situation is brought into intimate relation also with the external world. The skin is a complex, elastic, and sensitive organ, varying greatly in different conditions of climate, age, sex, health, and race; and varying also in the characteristics exhibited in different localities upon the same individual. Thus, in color there is a wide range between the fair skin of the blonde and the black skin of the negro, between the rosy pink of the infant's palm and the dark-brown hue of the genital region of the aged. The skin varies also in pliability and thickness, being delicate and lax over the eyelids, the lips, and the prepuce; and much thicker and more firmly attached over the palms and the soles.

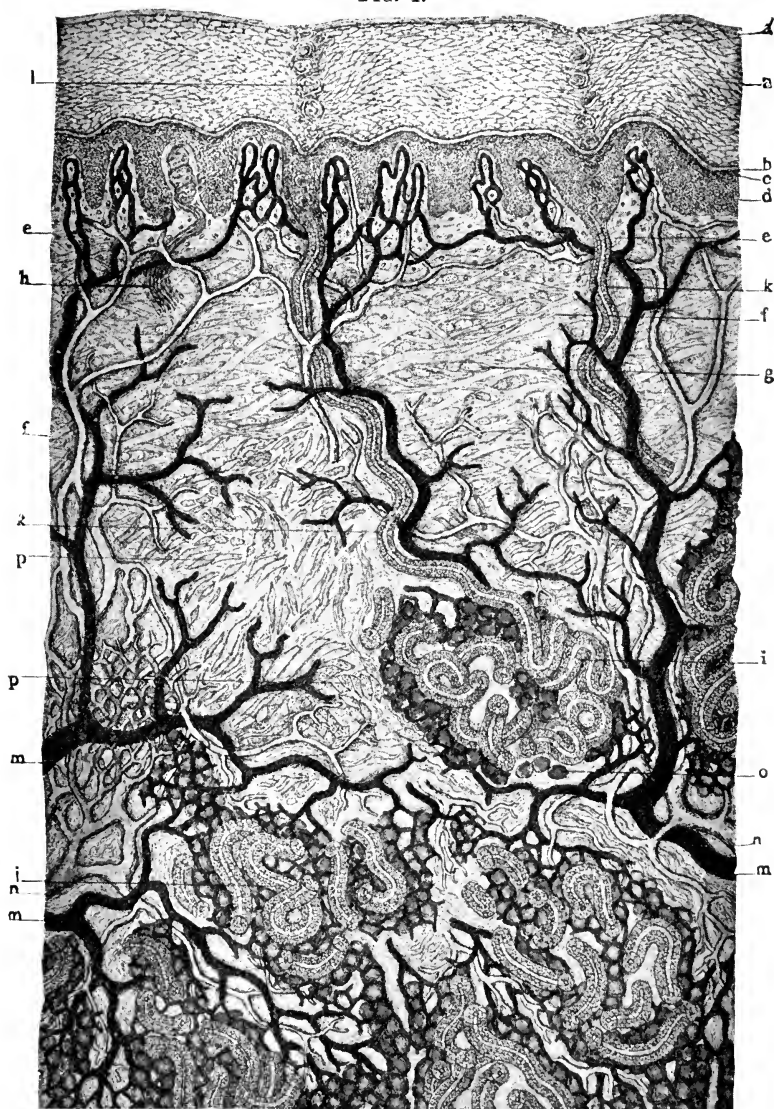
The appearance of the skin, even in conditions of health, changes within appreciable limits. It is the exposed parts (such as the face) which the eye of the physician most frequently searches, and which betray evidence of mental emotions, physiological fluxes, sedentary or active habits of life, and fatigue or unusual conditions of vigor.

Ridges and Furrows.—Viewed externally, the skin is seen to be traversed by superficial and deeper furrows, which vary in arrangement and size according to their situation. They are formed by the attachment of the skin to the deeper structures, by the movements to which the part is subjected, and by the arrangement of the fibrous structures of the corium. In some situations (palms and soles) the fine furrows have a regular arrangement and run parallel with each other. The pattern thus outlined is constant in the individual, of which fact use is made in the identification of criminals. Between these fine furrows are ridges dotted with numerous depressions representing the openings of sweat-pores. The entire body is traversed by fine furrows which form an irregularly diamond-shaped network.

Coarse furrows are found chiefly in situations where the skin is subjected to movement, such as about the joints, and they are due to the fixation of the skin to deeper structures by fibrous bundles. It is in such situations that fissures occur when the normal pliability is lost

¹For further details regarding the anatomy and physiology of the skin, the reader is referred to Duhring, *Cutaneous Medicine*, vol. i., pp. 1-71 (bibliography); Rabl and Kreidl, *Mraček, Handbuch*, Bd. i., pp. 1-266 (complete bibliography); Darier, *La Pratique Dermatologique*, t. i., pp. 7-59; Unna (translation by W. T. Alexander), *Ziemssen's Handbook of Skin Disease*, pp. 1-66; Besnier, Brocq, et Jacquet, *La Pratique Derm.*, t. i., p. 7, Paris, 1900; Poirier et Chospy, *Traité d'Anatom. Hum.*, Paris, 1904, v. 5.

FIG. 1.



Section of skin from the palm of the hand, magnified 150 diameters; a, stratum corneum; a', its superficial layer; b, stratum lucidum; c, stratum granulosum; d, stratum mucosum (rete); e, pars papillaris of the corium, loops of capillary vessels showing in vascular papillae; f, pars reticularis of the corium, showing coarse interlacing connective-tissue bundles; g, transverse section of the latter; h, double-contoured nerve-fibres passing to tactile body; i, coil-glands; k, ducts of coil-glands; l, sweat-pores passing to surface of the epidermis; m, arteries of the skin terminating in capillaries; n, veins of the skin forming plexuses; o, fat-cells, encompassed by capillary loops, in relation with coil-glands (the capillaries of the latter are purposely omitted in the drawing); p, obliquely and transversely divided bundles of connective-tissue fibres of the corium and subcutaneous tissue.

through inflammatory thickening. The shape of many of the lesions of the skin is determined by the ridges and furrows above described.

The digital extremities are protected by the nails, and the skin is provided very generally with coarse or with fine, downy hairs, which in some parts are of sufficient growth to conceal the skin from view. This pilary growth serves not merely as an ornament of the body, but also as a protection to some of its regions most sensitive to thermal changes.

Development of the Skin.¹—The corium is developed in intra-uterine life from the superficial layer of the mesoblast (the "skin-plate" of Remak). Its lower portions become first visible in a myxofibrous structure, which between the seventh and eighth months is replaced by a collagenous substance, from which the bundles of connective tissue develop, finer fibrillæ becoming later elastic fibres.

The epidermis springs from the ectoderm, and has therefore no primary histological relation with the corium, though at about the fourth month it is projected upon the papillary layer so as to give rise to the grooves and interdigitations which produce in the skin of the adult an important and intimate connection between the two.² At first a single layer, later two, three, and more rows of prickle-cells develop up to the fifth month, the horny covering persisting up to the seventh month merely as a thin stratum composed of but two rows of cells. The appendages of the skin are mostly developed between the sixth and eighth months.

Epitrichial Layer.—Welcher,³ Minot,⁴ and Bowen⁵ have described a layer of large cells, with round nuclei much larger than those of the epidermal layers beneath, covering the entire body of the human embryo during the early months of its existence. This layer, histologically, is quite distinct from the outer cells of the stratum corneum, and corresponds with the epitrichium of certain animals. It usually disappears before the sixth or seventh month of intrauterine life.

The integument of the body, when studied with the aid of the microscope, is found to be composed of several organic parts, which are: the subcutaneous connective tissue (the hypoderm), resting on the deeper structures of the body; then, more externally, the corium, or true skin; lastly, an outermost coat, the epidermis, or cuticle. Beside

¹ For detailed description, with illustrations, see MacLeod, *Brit. Jour. Derm.*, 1898, x., pp. 183 and 221.

² The researches of Leo Loeb (*Archiv. f. Entwicklungsmechanik d. organ.*, 1897, vi., p. 1), and of Alexander Maximow ("Experimentelle Untersuchungen über die Entzündliche Neubildung von Bindegewebe," *Ziegler's Beiträge*, Suppl. v.) show, however, that cells indistinguishable from epithelial cells may develop from the mesoderm. Kromayer (*Archiv*, 1902, lxii., p. 299) states that connective tissue may originate in epithelial cells, and he believes the corium is derived from the basal layer of the rete. He has, however, few supporters in these views. *Cf.* MacLeod, *Brit. Jour. Derm.*, 1903, xv., p. 257.

³ *Über die Entwicklung bei Bradypus*, Halle, 1854.

⁴ *Amer. Naturalist*, June, 1886.

⁵ *Anatomischen Anzeiger*, iv. Jahrgang (1889), Nr. 13 u. 14; and *Jour. Cutan. Dis.*, 1895, xiii., p. 485.

these parts, the skin contains coil-glands, sebaceous glands, hairs, nails, blood-vessels, lymph-vessels, muscles, pigment, and nerves. It will be instructive to study the deeper parts of the skin before considering those more superficially disposed, as their mutual relations will thus be made clearer.

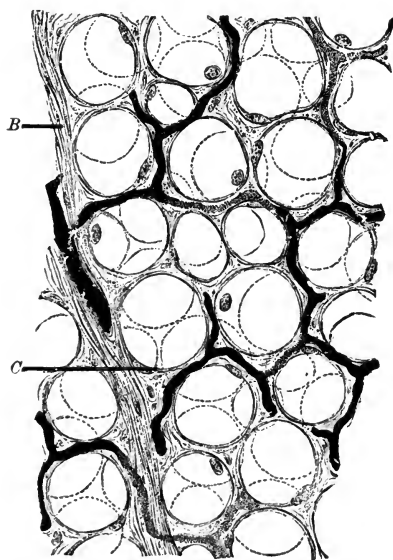
SUBCUTANEOUS TISSUE (STRATUM SUBCUTANEUM, PAN- NICULUS ADIPOSUS).

The subcutaneous tissue, or hypoderm, is differentiated from the corium between the third and the fourth months of fetal life. It is a structure serving a mechanical purpose as a receptacle for fat, and for the support of vessels and nerves passing from the tissue beneath to the corium which lies next above it. It contains, also, coil-glands, some of the hair-follicles more deeply seated than their fellows, and Pacinian corpuscles. There is no distinct boundary-line between the upper limits of the subcutaneous tissue and the overlying corium, to which it projects columnar masses of fat, extending obliquely to the

coil-glands and the hair-follicles above, often with lateral, horizontally disposed prolongations of similar shape. It is built up of loose connective-tissue bundles, prolonged from the aponeuroses, fasciæ, and the membranes lying beneath.

The subcutaneous tissue is attached firmly to the skin over the extensor surfaces of the articulations, the palms and soles, and the groins by short, coarse bundles, between which are single or multilocular spaces lined with endothelia secreting a mucoid fluid. Some of these are congenital; others result from evolution later in life. They are most frequent and largest where necessary movements occur, as where the skin is stretched over bone or tendon. These spaces are the *Bursa Mucoseæ*. Elsewhere as in the

FIG. 2.



Subcutaneous fat-tissue, the fat having been extracted with turpentine: *B*, bundles of fibrous connective tissue, carrying injected blood-vessels; *C*, capsules of fat-globules, with oblong nuclei. Magnified 500 diameters. (After HEITZMANN.)

and the auricle of the ear, the attachment to the skin is by loose, delicate connective tissue containing no fat-globules. All other fibrous tracts are arranged obliquely; they admit, by their extension, of various degrees of pliability, and inclose rhomboidal spaces containing more or less numerous fat-globules. These spaces are lobu-

lated, are bounded by a delicate fibrous connective tissue, and are supplied abundantly with blood-vessels.

The deposit of fat in the body is reduced greatly in all diseases productive of emaciation, but never wholly disappears during life. In cases of obesity, fat is deposited in excess of normal limits, and it may then be concerned in the production or the aggravation of disease. It is due largely to the greater or lesser volume of the panniculus adiposus that the natural outlines of the body are made to the eye graceful and attractive, or the reverse.

Columnæ Adiposæ (*Fat-columns of Warren*).—The credit of discovering and naming the *Fat-columns* belongs to Warren, whose studies were principally directed to the anatomy of the thick cutis vera.¹ The back and shoulders of a vigorous adult furnish an integument much thicker than the hide of many pachydermatous animals. The papillæ are imperfectly formed and are represented by an undulating line. The follicles of the lanugo-hairs penetrate only the superficial layers of the cutis. From the bases of the hair-follicles nearly vertical clefts, or slender, columnar-shaped spaces, extend obliquely to the panniculus adiposus. These shafts are named “fat-columns” or “fat-canals,” as they are entirely occupied by adipose tissue. (See Figs. 3 and 4.)

The fat-columns are about four millimetres in length, and slightly wider than the hair-follicles above. Their long axes form a slight angle with that of the follicle, but they are nearly parallel with that of the erector pili muscle. The horizontal prolongations are given off on either side of the middle of this axis, partly fat-filled. Near this point the coil of a sweat-gland is seen to be held in place by a few delicate fibres. The duct of the gland runs to the top of this space, whence it may be traced to the side of the hair-follicle. The connective-tissue fibres seem to terminate abruptly at the edges of these columns. The cleft slightly widens below, and on the side toward which its axis leans the fibres of connective tissue form a bundle penetrating below to the subcutaneous fat. The erector pili muscle is inserted partly into the base of the follicle and partly into the apex of the fat-canal. These columns correspond in number with that of the hairs. The blood-vessels they contain, which spring from the subcutaneous plexus, bifurcate at the lateral clefts. Unna demonstrates that the fat-columns invariably advance toward the coil-glands either singly or in groups, and that the connection of the fat-columns with the hair-follicles is a mere incident of that advance.

THE CORIUM, DERMA, CUTIS, CUTIS VERA, OR TRUE SKIN.

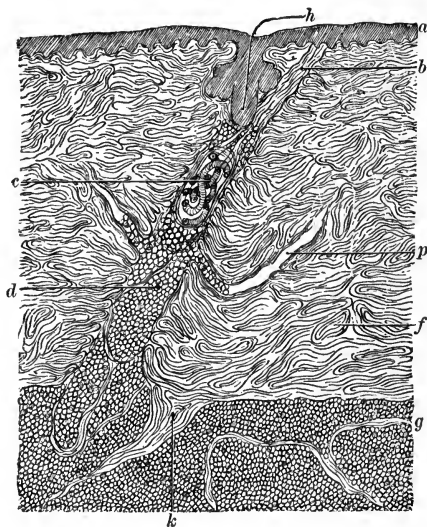
The corium is a mesoblastic structure made up largely of connective tissue and cellular elements. It is rich in blood-vessels and capillaries, especially in the papillary layer, and contains many nerves, nerve-endings, and terminal nerve organs. It also contains

¹ Satterthwaite's Manual of Histology, p. 420. New York, 1881.

lymphatics, small muscle-fibres, hairs, sweat-glands, and sebaceous glands.

The fibrous elements are of two varieties, collagen and elastin. The collagen occurs as bundles of fibres held together by a semi-fluid, interfibrillary substance, which stains brown with silver nitrate. The fibres are about $\frac{1}{3200}$ of an inch ($.79\mu$) in breadth and, according to Clarkson,¹ are made up of fibrils that are approximately $\frac{1}{50000}$ to $\frac{1}{20000}$ of an inch ($.05\mu$ to $.12\mu$) thick. The collagenous bundles are only slightly extensible, but as their arrangement presents a wavy

FIG. 3.



Vertical section of the skin showing: *a*, epidermis; *b*, erector pili muscle; *d*, columnæ adiposæ; *e*, coll-gland suspended in the columnæ adiposæ; *h*, sebaceous gland; *p*, horizontal prolongations of the column; *f*, fibrous bundles of the corium; *g*, panniculus adiposus; *k*, band of fibrous tissue extending into the panniculus adiposus. (After WARREN.)

appearance, on longitudinal section, they admit of stretching of the skin. The individual fibres do not branch, but such an appearance is simulated by the joining of parts of different bundles. The elastic fibres (elastin) occupy the entire corium and extend throughout the subcutaneous tissue. These fibres by anastomotic branches form a network which surrounds the collagenous bundles and all the other elements of this region acting as a supporting framework. These fibres vary in thickness from imperceptible fineness up to 11μ in breadth (Stöhr) and have little elasticity. They are the first to rupture when the skin is stretched, as is demonstrated in the "Lineæ albicantes," and their chief function appears to be that of support.

The cellular elements of the corium consist of connective tissue corpuscles, vacuolated cells (Schäfer), mast-cells, and migratory blood cells. (Description of these cells pp. 78-79.) The fibres and bundles of connective tissue are coarsest toward the subcutaneous

¹ Quoted from MacLeod.

tissue, and finest in the outermost portion which comes in contact with the epidermis above. They form the mesoblastic portion of the hair-follicle, the capsules around the coil-glands, and the layers which surround their ducts.

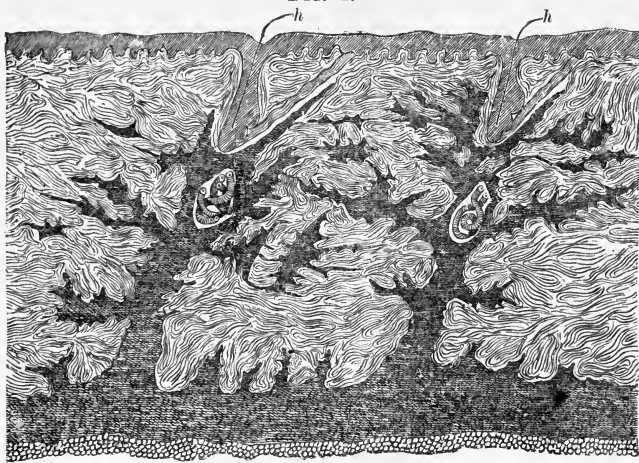
Corresponding with their anatomical structure the upper and lower portions of the derma are called respectively the "papillary layer" and the "reticular layer." There is no sharp dividing-line between these layers, the pars reticularis passing gradually into the pars papillaris above and into the subcutaneous tissue below.

Pars Reticularis.—The reticular layer of the corium is made up, as has been seen, of interlacing connective-tissue bundles, with interspaces increasingly larger from within outward. The fineness of the bundles decreases, in the same way, from without inward, being finest where the minute papillæ of the corium project into the rete, and coarsest near the subcutaneous tissue.

Pars Papillaris.—The papillary layer of the corium lies in contact with the rete above, and is connected below with the deeper reticular portion of the true skin. Between the rete and the papillæ of the derma a hyaline substance is interposed, which is supposed to be identical with the cement-substance surrounding and separating the fibrillæ of the corium. The basal membrane once thought to be stretched between the rete mucosum of the epidermis and the papillary layer of the corium cannot be demonstrated to exist.

Viewed obliquely with an amplification of about three hundred diameters, it will be seen that long and slender filaments from the prickle-cells of the mucous layer of the epidermis encircle in a spiral

FIG. 4.



Vertical section of skin after injection (from beneath) of areolar tissue with Berlin blue: *a*, epidermis; *f*, corium; *g*, panniculus adiposus; *h*, sebaceous gland. (After WARREN.)

direction both nervous and vascular papillæ. At the apices of the latter these threads completely surround the connective-tissue fibres.

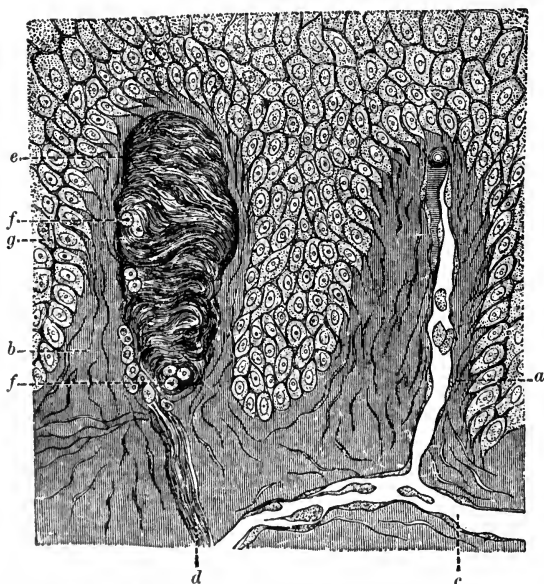
The name of this portion of the derma is intended to describe its chief characteristics, the existence of numerous digital prolongations or nipple-like prominences of the corium, made up of delicate connective-tissue fibres which do not interlace and which are abundantly provided with nuclei. The papillæ spring each from a single, or several from a common, ovoid base; their bulbous, conical, or blunt apices reach into the rete, which also dips down between them in prolongations termed "rete-pegs." The papillæ vary in size in different parts of the body, and also in their disposition and shape, being in places arranged in linear series, and in others in concentric whorls, with definite centres, thus producing crossing-furrows, visible to the naked eye as markings upon the outer surface of the epidermis. The largest are found on the palms and soles and over the inner faces of the digits. It has been estimated that one hundred are developed within each square millimetre of the body-surface.

In horizontal sections of the skin the papillæ, being transversely divided, appear as circular or ovoid areas, in which can be recognized centrally a transversely or obliquely divided capillary loop. Between these areas is seen the interpapillary reticulum of the mucous layer.

The growth of the rete downward and of the corium upward results in mutual effects of pressure and counter-pressure, the equilibrium of which is constantly adjusted by the mechanical and vital necessities of such union.

When the papillæ are completely exposed, after removal of the overlying cement-substance and of the epidermis above, their exterior

FIG. 5.



Vascular and nervous papillæ: *a*, vessel; *b*, nervous papilla; *c*, vessel; *d*, nerve-fibre; *e*, corpusculum tactus; *f*, transversely divided nervous filaments; *g*, epithelia of rete. (After BIESIADECKI.)

surface is seen to be uniformly marked with series after series of alternating furrows and ridges of exceeding delicacy and more or less concentrically disposed. Into the grooves are admitted corresponding dentations that can be recognized on the under surface of the layer of epithelial cells next the corium. They may, however, be the furrows left after separation of the long prickles wrapped about the papillæ and traceable to the mucous layer.

Two varieties of papillæ are distinguished—the vascular and the nervous; the former contain the terminal loops of a minute artery and vein, and the latter the terminations of medullated nerve-fibres.

The greater number of the papillæ are of the vascular variety, being traversed by a vertically disposed loop of vessels, consisting of an arterial and a venous capillary. The office of the vascular loop is evidently not merely to supply nutriment for the epidermis above, but also to provide for the cooling of the blood when brought in large quantities to the surface of the body. Occasionally, two or more of such loops can be recognized in a single papilla.

The nervous papillæ contain the tactile corpuscles, which subserve an important purpose in providing for the sensibility of the integument. The tactile corpuscles are described in connection with the nerves of the skin. Ultimate terminations of nerves can be recognized in the vascular papillæ, and at times minute vascular loops can be seen in the papillæ largely occupied with the corpuscles of touch.

Lines of Cleavage.—Puncture of the skin with a rounded instrument leaves an irregularly longitudinal slit. This phenomenon occurs as a result of the arrangement of the connective-tissue bundles and fibres of the corium. Dupuytren¹ studied this in the skin of the palm and Langer and Heitzmann² later mapped out the special directions over the entire body in which these lines occurred.

THE EPIDERMIS, SCARF-SKIN, OR CUTICLE.

The epidermis is the most external of the several membranes of the body, being in close contact on one side with the corium, or true skin, and exposed on the other to the atmosphere by which it is surrounded. The latter surface is therefore relatively drier, while the former is constantly moistened by fluids from the vessels which ramify beneath it. It is of epiblastic origin and is made up of superimposed strata of epithelial cells, and varies in aspect and thickness according to its anatomical situation and the age of the subject.

No genetic relation exists between the epidermis and the corium, notwithstanding their intimate union and mutual relationship. The epidermis is developed from the ectoderm, the corium from a superficial layer of the mesoblast. Their behavior both in health and in disease is marked by the widest difference.

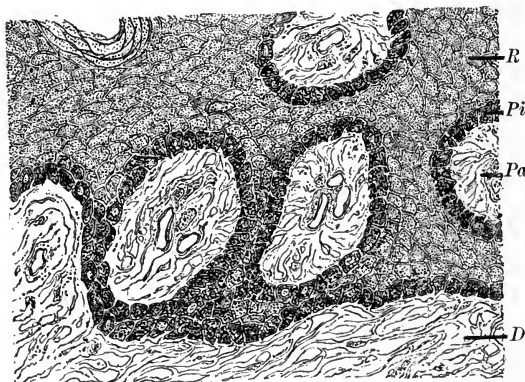
The epidermis varies greatly in thickness in different portions of

¹ *Über die Verletzungen durch Kriegswaffen aus der Franz.*, 1836, p. 27.

² *Archiv f. Derm. u. Syph.*, 1890, xxii., p. 3. (Quoted from MacLeod.)

the body; for example, the epidermis of the palms and soles exceeds in vertical section that which covers the dorsum of the hands and feet, and that which protects such sensitive parts as the eyelids, lips, temples, and prepuce. The epidermis is composed of the following principal layers, named in order from within outward: the stratum

FIG. 6.



Scalp of a negro—horizontal section: *R*, rete mucosum; *Pi*, row of columnar epithelia (cut obliquely) supplied with dark-brown pigment-granules; *Pa*, papilla (cut transversely); *D*, derma. Magnified 500 diameters. (After HEITZMANN.)

mucosum, the stratum granulosum, the stratum lucidum, and the stratum corneum. All of the cells composing these various layers are derived from the basal layer of the rete. Beside these, Ranvier and others recognize a stratum germinativum, a stratum filamentosum, a stratum intermedium, and a stratum disjunctum.

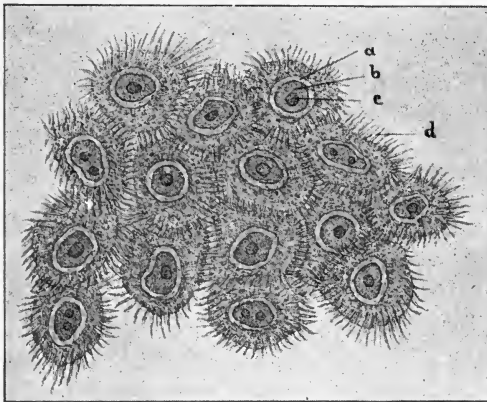
Rete Mucosum (*Mucous Layer, Prickle-Layer, Stratum Mucosum, Rete Malpighii or Malpighianum*).—This is the deepest of the epidermal layers, and rests upon the corium below. It is generally designated as “the rete.” The corium is intimately united with it by a series of interdigitations, which are commonly described as prolongations of the derma into the substance of the rete, but it is equally true that the rete sends down prolongations (the “rete-pegs”) into the derma. The two, in the need of an intimate union to resist friction and to insure vascular supply, are thus closely locked together.

The stratum mucosum is built up of nucleated epithelial cells, which are polyhedral in outline. These cells are masses of granular protoplasm, living matter, which by their relation to one another form a protoplasmic network enveloping the entire surface of the body and lining all channels and cavities in direct or indirect connection with the surface. These elements are flattened by reason of their apposition, and are separated from one another by an intercellular cement-substance. There is a system of channels between the epithelia by which the nutritive fluids are conveyed from cell to cell. All are, however, uninterruptedly united by delicate spokes, known as

prickles, spines, or thorns. The epithelia are unprovided with either blood-vessels or lymph-vessels; but are supplied with a large number of nerves, which, in the shape of very minute beaded fibres, traverse the intercellular substance, and which are in direct communication with the reticulum of living matter within the protoplasmic bodies themselves.

The masses of protoplasm just described play the most important part in all the pathological and physiological processes observed in

FIG. 7.



Prickle-cells from a condyloma (magnified about 625 diameters): *a*, cavity of cell-nucleus; *b*, nucleus; *c*, nucleolus; *d*, prickles—these are greatly developed on the protoplasm of the cells. The dots on the surface of the protoplasmic mass represent the appearance of the prickles when directed toward the eye of the observer. Some of the protoplasmic threads are seen passing from one cell to another.

the skin. It is probable that in the embryo all the appendages of the skin are formed directly by their assimilative and reproductive processes; and it is certain that in health and in disease they are the ultimate source of all secretions.

Next the corium is a layer (*basal layer, stratum germinativum*) of cells, columnar in form, often largely provided with pigment, and arranged with their long axes nearly at right angles to the plane of that portion of the corium upon which they are superimposed. The cells of this layer are dividing constantly by mitosis, the daughter-cells pushing outward to form the succeeding layers. The entire epidermis thus is derived from this single (occasionally double) row of columnar cells. More externally the cells are rounded or cuboidal in shape, with large, distinct nuclei. They are not arranged in definite strata except in the outermost layers, where the cells are somewhat flattened and elongated (*stratum filamentosum*). Between the cells in the deeper layers outwandered leucocytes may at times be recognized.

Langerhans' Cells.—These are elongated, irregularly stellate, non-nucleated bodies found chiefly in the deeper parts of the rete. They

have been looked upon as pigment-cells devoid of pigment, as wandering cells, lymphoid cells, and as colorless tissue-corpuscles.

Stratum Granulosum (*Granular Layer*).—The stratum granulosum of the epidermis, lying immediately above the stratum filamentosum, is built up of three or four rows of horizontally disposed granular bodies, united to one another by short, broad threads. Between these bodies the intercellular spaces are so contracted that nutritive fluids cannot easily filter outward; and the nuclei of the cells are usually shrunken. These have been studied carefully by Ranvier, Kölliker, Waldeyer, and others. According to these observers, the roundish granules which give this layer of epithelium its name and peculiar appearance consist of keratohyalin,¹ a substance that plays a part in the process of cornification. These granules first appear in the neighborhood of the nuclei of some of the large prickles-cells in the rete, but they are best studied in the granular layer the cells of which are often completely filled with them. According to Unna, the color of the skin in the white races depends upon this layer alone.

Stratum Lucidum (*Septum Lucidum*) of Oehl lies immediately above the stratum intermedium, and appears under the microscope as a delicate, brightly colored line consisting of two or three rows of transversely disposed glistening epithelia, differing in translucency from those situated on either side. The stratum lucidum thus marks with tolerable distinctness the boundary-lines of the rows of cells above and below it. Its epithelial bodies seem to have lost suddenly the refractive, shining granules of keratohyalin conspicuous in the stratum granulosum below, and to have acquired the oily looking substance termed eleïdin.

Stratum Intermedium (*Ranvier*).—This is practically a subdivision of the stratum lucidum, from which it is distinguished chiefly by the fact that it takes a reddish stain after treatment with picrocarmine. It is here that the process of keratinization of the epidermis is first to be detected.

Stratum Corneum (*Horny Layer*) of the epidermis is its outermost and widest layer, extending from the stratum lucidum below to the external environments of the body. In its lower portion the polygonal plates of which it is composed indicate very clearly their relationship to the cells in the prickles-layer. The nuclei appear in places only as shrivelled and inconspicuous relics of the protoplasmic threads; or there may be merely vacant nuclear spaces marking their original site. Occasionally, on the edges, rudiments of the prickles-threads may still be recognized. More externally the dried, lifeless,

¹ Keratohyalin is a solid or semisolid substance which is situated in the stratum granulosum, and is differentiated well by a hæmatoxylin stain. It is insoluble in ether, alcohol, and chloroform, but is destroyed by strong acids and alkalis. Chemically it is of the nature of hyalin.

Eleïdin is an oily-looking, though not a fatty, substance, situated in the stratum lucidum. It differs from keratohyalin physically and chemically, but MacLeod suggests that it may be a derivative of keratohyalin. Its differentiation requires special staining methods. Cf. MacLeod's Pathology, p. 61.

horn-like plates of which this layer is composed become mere cornified shells, generally lying in horizontal strata, and becoming more curled and wrinkled as the surface of the skin is reached, often being imbricated, but preserving the polygonal outlines of epithelia relieved of the forces of pressure and counter-pressure exerted in the deeper parts of the epidermis. These elements are rarely pigmented, save in the case of the negro, in whom the intense staining of the deepest parts of the mucous layer extends measurably to the external strata. This staining in the colored races is produced by granules of pigment arranged about an unpigmented nucleus in the prickle-cells. The cells of the horny layer contain fatty material in very considerable proportion, a provision by which the suppleness of the skin is maintained and undue evaporation prevented. Neither keratohyalin nor eleidin is found in this layer, but there appears in their place a resistant substance termed *keratin*, to which the hard, dry character of the cells is due. Keratin is insoluble in 50 per cent. dilution of mineral acids, and resists digestion in a solution of pepsin containing weak hydrochloric acid, but is soluble in weak alkaline solutions.

After digestion with pepsin and trypsin the horny cells may be seen to be connected by more or less persistent threads, visible after prolonged digestion as a large-meshed reticulum, with strands formed from a double row of cornified filaments united by short horny bridges.

Stratum Disjunctum (*Ranvier*).—This is the most superficial of the layers of the stratum corneum, differing chiefly from the latter in that it is indifferently colored by osmic acid.

Spiral Fibers.—Herxheimer's¹ spiral fibers are found chiefly between the cells of the rete and basal layer of the epidermis. They are most abundant normally in the lower part of the rete and become increased in number in inflammatory conditions. They lie for the most part parallel with the long axes of the rete-cells. They sometimes are found between the cells of the inner root-sheath of the hair follicle. Opinion differs as to their nature. Jadassohn, Ehrman,² MacLeod,³ and others believe them to be spirals of fibrin. This seems probable since they are increased in number when an inflammatory reaction is present and since they occupy the lymph-spaces between the cells and in size correspond to these spaces. They have in the past been regarded as elastic fibres protruding from the corium below; as parts of a canal system for conveyance of nutriment to the cells of the epidermis, etc.

Cornification.—The process by which the epithelial cell from the basal layer of the rete becomes transformed into the hard resistant cell of the stratum corneum has been studied at length, and the part played by the keratohyalin of the granular layer, and eleidin of the

¹ Archiv f. Derm. u. Syph., 1889, p. 645.

² Archiv f. Derm. u. Syph., 1892, Ergänzungsheft, i, p. 307; and Monats. f. prakt. Derm., 1897, xxiv, p. 549.

³ MacLeod, Histopathology of the Skin, 1903, p. 59.

stratum lucidum in the formation of keratin has caused much controversy. While as a rule when cornification is perfect both keratohyaline and eleidin are present normally, and when these two are absent or imperfectly formed cornification is incomplete, yet cornification may occur without the interoccurrence of these substances. MacLeod considers "keratohyalin as a separation product of the protoplasm of the cell which appears as the vitality of the cell is diminishing; eleidin, a further product of the same substance; and the ultimate product of both is probably the fatty or waxy substance which is present in the horn cells." The same author states further: "The intercellular bridges or prickles would, according to this hypothesis, become hardened into keratin by an inherent power of their own in much the same way as the fibro-vascular system of a leaf at the fall of the year becomes hardened into a brittle leaf skeleton."

BLOODVESSELS.

The arteries and veins supply the skin from subcutaneous branches which penetrate the underlying fasciæ, and proceed by subdivision to be distributed to all portions of the integument below the epidermis, the distribution being especially abundant about the glands and follicles of the skin and the inferior and superior parts of the corium. They are always more abundant upon the flexor than upon the extensor faces of the extremities. Just beneath the papillary layer of the corium there is a minutely ramifying plexus of fine capillaries, the loops of which extend into the papillæ above. This and the coarser plexus in the deeper portion of the derma are well defined, and have been designated as superior and inferior partes vasculares of the corium; also, as the upper and lower vascular net. They are connected by more or less regularly placed and nearly vertical communicating branches. A fourth division of the vascular system of the skin is found in the subcutaneous connective tissue, in which the vessels are numerous; a fifth is represented by the vessels distributed to the papillæ; and lastly, a sixth includes the vascular channels supplying the accessories of the integument.

The arterioles which supply the sweat-glands surround the coils of the latter in a delicate basket-like plexus, and terminate in two or three veinlets, one of which always accompanies the duct of the gland upward as far as the papillary layer, where it anastomoses with the vessels of that part of the skin. The ascending arterioles supply the sebaceous glands and hair-follicles, and, breaking up into smaller and yet smaller branches, finally furnish a single or a double capillary loop to each papilla. These capillaries of the papillary layer anastomose freely with those transversely arranged in the upper portion of the hair-follicles, from which loops also pass to the sebaceous glands. The hair-papilla has a vascular supply similar to that of each of the other papillæ of the corium.

Unna divides the vessels distributed to the skin into the papillary

system and the system of the coil-glands and fat-tissue. The first system includes the ascending loops which traverse the vascular papillæ, and the branches supplying lower portions of the corium. The second system embraces the vessels running upward to the coil-glands and downward to the fat-tissue. In the papillary vascular system the arteries are narrow and the veins wide. Each of the vessels consists merely of an endothelial tube augmented, as the subcutaneous tissue is reached, by both media and adventitia. According to Hoyer, a singular duplex arrangement of vessels in the distal phalanges of both fingers and toes results in a distinct communication between the arteries and veins. Other observers deny the existence of such anastomosis.

Vasomotor nerves are twined around these vessels in all their ramifications. The whole vascular system, as thus arranged, plays a most important part in all the healthy and morbid processes which occur in the skin, as well as in the physiological changes distinguishable to the eye in the phenomena of blanching and blushing.

LYMPHATIC VESSELS.

The skin in all its parts is provided with a closed system of lymphatic channels, designed to subserve the necessities of the important processes of absorption, and is traversed by lymph the currents of which are continuously directed to the large vessels of the structures beneath the skin. These channels include: first, juice-spaces, provided or not with independent walls, usually without, and not freely communicating with the endothelium-lined vessels; second, lymphatic vessels proper. These conduits do not connect with blood-vessels.

The juice-spaces, or lymph-spaces, separate the epithelial bodies which make up the stratum mucosum of the epidermis, and they also extend between the protoplasmic threads, or prickles, that unite them. Such conduits may be regarded either as delicate excavations in the cement-substance between the epithelia, or as irregular channels in a soft, viscid, albuminoid, and readily coagulable substance between the protoplasmic threads. At times this intercellular substance seems capable of obstructing the conduits by which it is tunnelled. These juice-spaces exist in the papillæ of the corium, and encircle the several glands, hair-follicles, and nail-beds of the skin. They also sheathe the connective-tissue fibrillæ of the corium and surround the fat-cells. According to Darier, the derma is a "true lymphatic sponge."

The lymphatic vessels are relatively few, but they form a continuous meshwork with transversely and vertically disposed branches supplying all parts of the skin below the epidermis. The juice-spaces communicate with these vessels in the papillary portion of the corium through minute orifices in the vascular walls, the vessels themselves being here represented by blind terminal loops. As these vessels pass to the deeper portions of the corium and below it they increase in size.

The current of the lymph flows from the papillary apices to all parts of the rete, like the currents in the delta of a river, a reflux occurring at the lower limit of the interpapillary depressions of the rete downward, possibly through the sweat-pores which traverse the epidermis at these points. Thence the current flows freely downward to the lymphatic vessels in the corium, but the stream from the juice-spaces about the coil-glands and fat-tissue is retarded by reason of a more restricted communication with the lymphatic vessels below. In consequence of the retardation due to this anatomical peculiarity the formation of fat by filtration is facilitated.

NERVES.

The skin, in view of the number and mode of distribution of its nervous elements, may be regarded as a vast area of sensitive nerve-terminals. Non-medullated and medullated nerve-fibres, each in places being substituted for the other, are supplied to the skin from horizontally disposed bundles of nerve-twigs in the subcutaneous tissue. These fibres traverse the corium in connection with the blood-vessels, and become finer as they ascend, until they form a subepithelial plexus just below the epidermis.

Non-medullated Fibres are exceedingly delicate fibres, penetrating in great abundance to the epidermis between the epithelia, and are not to be confounded with the migratory cells found in this situation. Here, traversing the intercellular substance by the side of the juice-spaces, these fibres either terminate between the prickle-cells as ultimate bulbous terminations of finely beaded fibrillæ, or penetrate the epithelia themselves in pairs. Each prickle-cell is supplied with a pair of these beaded filaments, which may be either applied to the nucleus of the cell or be seen to encircle the nucleus more or less completely. Above the stratum granulosum these nervous threads cannot be recognized.

Similar nerve-filaments are supplied to the sheaths of the hairs and the ducts of the coil-glands. It is by means of these numerous and delicate fibres that the perception of sensation in the skin is accomplished.

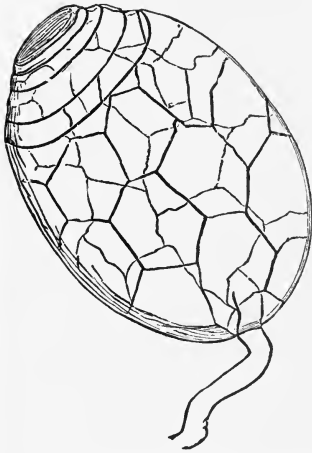
Motor filaments are also distributed to the sheaths of the blood-vessels (vasomotor nerves), in which they are finally lost. Other motor filaments supply the muscles, and trophic nerves are distributed to all the secreting organs of the skin and to all its protoplasmic formations.

Medullated Nerve-fibres of the skin in one or several loops pass upward into the papillæ, and then turn backward to the subpapillary region. Some of these fibres, after such reversion, again ascend to an adjacent papilla; others are supplied to the Pacinian and tactile corpuscles.

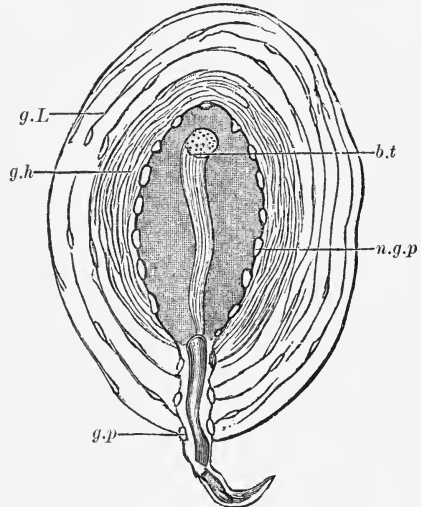
Pacinian Corpuscles (named from the anatomist Pacini), also called *Corpuscles of Vater*, exist subcutaneously only upon nerves

intended for cutaneous supply; they are ovoid bodies, two or more millimetres in diameter. Each corpuscle consists of a series of concentric, nucleated, vascular capsules, arranged after the manner of the capsules of the onion, more closely united at the periphery than at the centre, and surrounding a protoplasmic core. The medullated nerve to which the body is attached gradually loses its myeline envelope, and terminates in the centre of this core, after traversing the greater

FIG. 8.



Pacinian body, after silver staining, showing superimposed endothelial layers. (After RENAULT.)



Section of Pacinian body from a duck's bill: *g.l.*, lamellar envelope; *g.h.*, hyaline zone of the lamellar envelope; *b.t.*, terminal bulb of the nerve; *g.p.*, *n.g.p.*, layer investing the cavity of the body. (After RENAULT.)

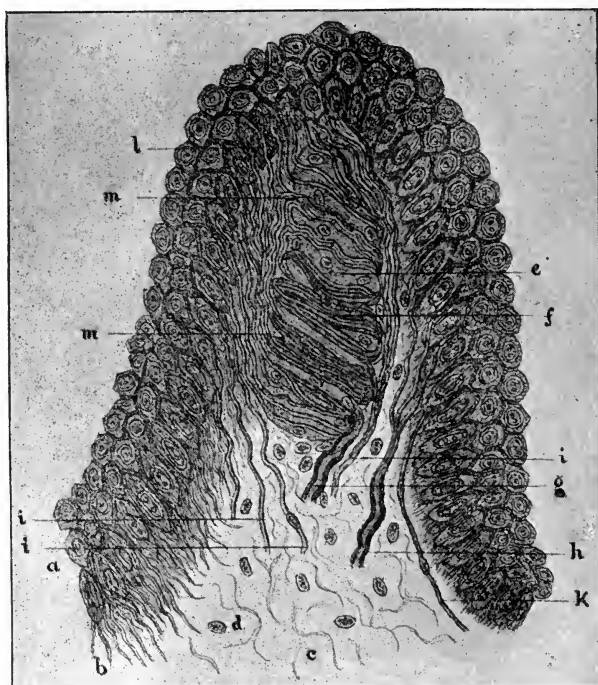
part of its axis, in one or several minutely club-shaped filaments. The myeline sheath is lost in the tissue of the concentric capsules. The nerve may, after supplying one capsule, penetrate a second or even a third. In such cases the nerve regains its sheath as it issues from the corpuscle at its opposite pole. Robinson believes that the nerve forms a plexus or loop within the corpuscle, and escapes from it at one of its poles.

The precise function of the Pacinian corpuscle is unknown. Its connection with the tactile sense is suggested by its location, since these bodies are most numerous in the subcutaneous tissue of the nipple, the penis, the digits, and in parts similarly sensitive. These corpuscles bear an analogy to the organ of vision; each body having a capsular character; each being provided with a special nerve-filament, which enters the corpuscle at one pole; each also receiving its impressions at the extremity of the capsule opposite that at which it receives its nervous supply.

According to Krause, the Pacinian corpuscles aid in the appreciation of impressions produced by pressure and traction. Whether

specially concerned in distinguishing sensations of heat, cold, moisture, pressure, traction, or weight, it is evident that they contribute but little, if at all, to the perception of ordinary impressions upon the skin, and they are not known to play any part in cutaneous diseases.

FIG. 9.



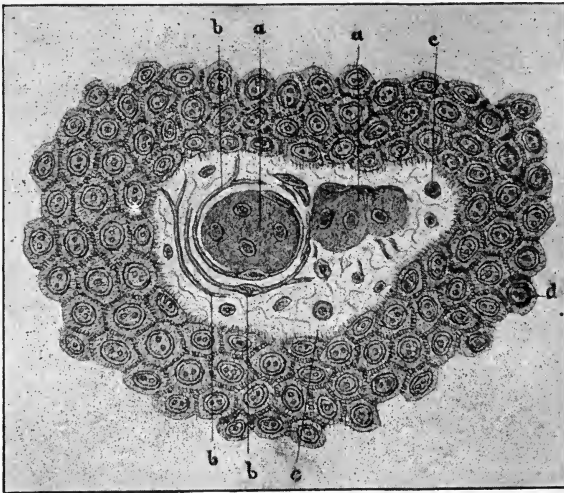
Section of a papilla still covered by a portion of the stratum mucosum and containing a tactile body (from the skin of a finger). The corpuscle of Meissner is seen to consist of minute lobules, made up of a homogeneous protoplasm, with numerous oval nuclei and nervous fibrillae wound in a spiral direction about the mass of the corpuscle. The extension of the fibrillae to the mucous layer is shown. The courses of the nerve-filaments are demonstrated to be: (1) the axis-cylinders of one or two double-contoured nerve-fibres, splitting into their original fibrillae on arriving at the corpuscle, winding about the latter in characteristic spirals, and passing to the palisade-layer of the prickles of the rete, between which, on account of the long prickles of the latter and the general resemblance of the two in thickness and contour, it is difficult to trace them further; (2) filaments from another double-contoured nerve-fibre (*h*) pass directly to the inferior layer of cells in the rete without establishing relations with the tactile body; (3) fibrillae derived from the network of nervous fibrillae in the pars papillaris of the corium (*k*), also passing more or less directly to the stratum mucosum. *a*, cells of the rete; *b*, prickles of the latter; *c*, body of papilla; *d*, nuclei of connective tissue forming papilla; *e*, protoplasmic part of the tactile body with its nuclei; *f*, fibrillae of the corpuscle; *g*, double-contoured nerve-fibres directly supplying the rete; *h*, nervous fibrillae derived from the network in the pars papillaris; *i*, nervous fibrillae entering the epidermis between the rete-cells, leaving the corpusculum tactus at *m*.

Tactile Corpuscles (*Corpuscles of Meissner, or of Wagner*) are ovoid bodies found in about one in four of the papillae in the pars papillaris of the corium. Each corpuscle is composed of from one to three capsules. Minute lobules of a homogeneous protoplasm with oval nuclei are found in each. These corpuscles receive medullated nerve-fibres, and are made up of closely compressed, flat connective-

tissue fibres with minute nuclei, which are so packed together as to form a spindle-shaped mass occupying the greater part of the papilla in which each corpuscle is found and surrounded by a somewhat denser connective-tissue capsule. The myeline sheath of the nerve-fibres is lost in the fibrous tissue of the corpuscle. Externally viewed they seem to be transversely striated.

The axis-cylinder of the nerve-filament distributed to each corpuscle divides into numerous delicate nerve-threads which in part

FIG. 10.



Transverse section of nervous papilla surrounded by cells of the stratum mucosum : *a*, protoplasmic lobules of the corpusculum tactus; *b*, nervous fibrillae spirally wound about the latter; *c*, transverse section of double-contoured nerve-fibres; *d*, cavity of nucleus (out of focus).

encircle the corpuscles and also penetrate within. Each corpuscle is provided with an afferent and an efferent nerve, the former approaching the corpuscle from the subpapillary region and entering at or near its base. Occasionally the afferent fibre is furnished by an adjacent papilla. As the filament that enters the corpuscle frequently divides, two or more efferent fibres may then escape from it. Afferent fibres reach the rete above after encircling the tactile corpuscles; others, side by side, arrive at the rete without coming into contact with the former.

The discovery of nerve-filaments in and among the epithelia of the epidermis in such abundance as to provide fully for tactile sensation in the skin leaves the exact function of these corpuscles in partial obscurity. There can be little doubt, however, as to their association with the perception of certain qualities of foreign bodies with which the skin may be brought into contact.

Touch-cells.—Merkel's Touch-cells are oval, nucleated bodies found in the lower animals, but also in man. They are supposed to be connected with the ultimate nerve-fibres. They resemble cells in a

mitotic state, and are found in the upper parts of the corium as well as the epidermis, and in regions in which the tactile corpuscles are few, as over the abdominal surface.

Corpuscles of Krause (*Bulb-corpuscles: Kolbenkörperchen*) are rounded or oval-shaped bodies formed of a connective-tissue envelope and a non-nucleated bulb to which some delicate nerve-fibres penetrate. These bodies are found chiefly along the borders of the lips, over the glans penis, the clitoris, and the tongue.

PIGMENT.

The hue of the living integument is due in part to the degree of vascularity and distention of the vessels in the corium, and in part also to pigmentation of the epidermis. The coloring-matter of the skin in health is deposited chiefly in from one to four rows of cells in the lower stratum of the rete, the fine granules of pigment staining both the cell-body and the nucleus, the latter more vividly. The pigment of the skin depends for its hue upon a substance called melanin, which occurs in amorphous granules of an albuminous material containing sulphur. Its office is obvious. It is designed to abort rays of light and thus to aid in the protection of the body from undue insolation.

The degree of vascularity of the skin is responsible for most of the flesh-tints, but the colors seen in the various races of men are wholly related to the character and quantity of pigment found in the rete. Rarely, pigment-cells are found in the corium in a state of health. This pigmentation depends upon a distinct and uniform coloration of the epithelia, and also upon minute granules of melanin entangled in the reticulum of living matter in the same part. Extreme variation in the distribution of pigment is noticeable both in health and in disease, and in individuals and races, being at times related to climatic and similar influences. This fact is well illustrated by the wide range between the flaxen-haired, pink-eyed albino and the blackest specimens of the negro, each, with small exception, being of African descent.

It has already been noted that in the colored races the pigment may stain the epithelial cells and their nuclei as high as the granular layer; and that to this layer only is due the characteristic color of the skin of the white races. Pigment is not normally found either in the horny layer of the skin or in the subepithelial tissues. Waldeyer claims to have recognized it in normal connective tissue.

The source of the pigment in the skin has not been positively determined. It is believed by some to be carried by leukocytes from the corium beneath to the rete above; others have thought that the pigmented cells themselves were capable of migration. Yet others teach that the pigment is produced *de novo* within the rete-cells. It is most probable that the pigment is derived from the subepidermal structures, and is originally obtained from the blood itself.

The relation existing between the two sources of skin-coloration, viz., the blood and pigment, is interesting and suggestive. The unaided eye, looking at the outer surface of the body, makes little distinction between these two color-sources. It is certain that solar heat exerts a manifest influence upon both, and that in extravasations of blood into the substance of the skin every shade of color visible in the spectrum may at times be distinguished.

MUSCLES.

Striated Muscular Fibres extend from the subcutaneous tissue into the derma; in the case of man they are found chiefly upon the face and neck, where they are the analogues of more powerful skin-moving muscles possessed by several of the lower animals. Some, as those in the region of the face, serve to give expression to mental emotion by the production of facial movements.

Non-striated Muscular Fibres exist either as minute oblique fasciculi in connection with the glands and follicles of the skin; or as annular bands, such as those which surround the nipple; or as radiating and more or less parallel rods, such as antagonize the orbicularis in the eyelids.

Arrectores (Erectores) Pilorum.—These muscles are found usually in connection with the hair-follicles. They originate by minute multiple fasciculi from the papillary portion of the corium, and are inserted at several points into the outer layer of several adjacent hair-follicles, just above the plane of the apex of the hair-papilla. Their general direction is oblique, and their muscle-bundles are embraced and traversed by elastic fibres which form a dense network about them. Elastic threads also connect them intimately with the connective-tissue bundles of the corium, and serve as tendons at either extremity of each muscular fasciculus.

The muscles, by virtue of their oblique direction and mode of attachment, include in the angle subtended by their muscular fibres the sebaceous glands connected with the hair-follicles. It follows, therefore, that by their contraction they aid in the expulsion of the sebaceous secretion formed in the gland; but their intimate union with the elastic tissue, which is evenly and generally distributed throughout the framework of the corium, results in their discharge of a still more important function in connection with the regulation of the body-temperature, since by virtue of direct compression exerted upon the skin the blood may be driven from the surface in a centripetal direction and its cooling in a great degree prevented, as in the well-known phenomena resulting in the production of the *cutis anserina*, or "goose-flesh." The reverse of this naturally follows when the muscles expand under the influence of external heat. The anatomical connections of the arrectores pilorum are such that their contraction serves to approximate several of the papillæ of the corium, including the hair-papilla. Thus, by their contraction the sebaceous secretion

may be extruded, or, as is more particularly exhibited in the lower animals, such hairs as the bristles of the boar may be erected.

Muscular Membranes exist in the skin of the scrotum, over the penis, about the nipple, and elsewhere. They are simply layers of smooth muscular fibres, which suffice when contracting to move the portions of skin to which they are distributed.

HAIRS.

Hairs are cylindrical, elongated, and pointed epithelial filaments, derived from the epidermis, and obliquely implanted in depressions in the rete and corium, known as "hair-sacs," or "hair-follicles." They are found on all the superficies of the body except the palms and soles, the dorsum of the distal phalanges of the hands and feet, and the skin of the penis. Hairs occur in three tolerably distinct classes. These are: the fine, downy hairs, or lanugo, covering the face, the trunk, and the limbs; the long, soft hairs, such as those implanted upon the scalp, the pubes, and the axillæ; and the short hairs, including the soft varieties seen upon the brow and the stiff hairs of the eyelids.

The hairs are first developed in the third month of fœtal life, when a short epithelial cone is formed, the base of which is gradually surrounded by connective-tissue cells, and finally indented from below by a rudimentary hair papilla. Gradually the tip of the rudimentary hair perforates the primitive hair-cone and becomes a mature filament. At about the period of birth, sometimes earlier, occasionally later, the "bed-hairs," as they are called by Unna, are replaced by papillary hairs. The term *bed-hair* is applied to primary hairs unprovided with papillæ, and implanted in shallow follicles, from the sides of which productive epithelial offshoots have been sent out. Usually at the end of fœtal life these bed-hairs have been for two months growing out of the hair-bed, or that part of the epithelium found in the central part of the hair-sac.

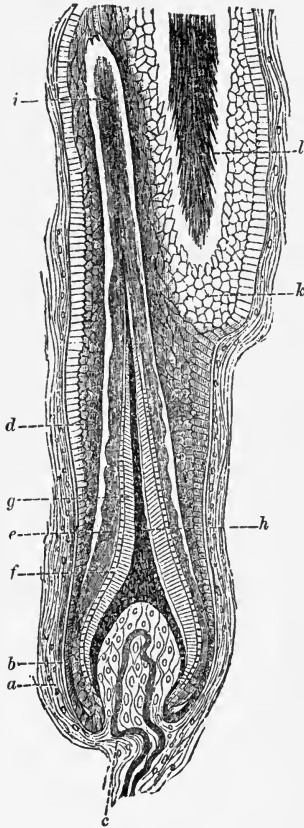
Hairs thus differ from nails not only in their anatomical features, but particularly as to their physiological reproduction. Hairs are periodically cast off and replaced by new filaments. The nails are shed and reformed only in disease; in health they enjoy a continuous growth during the life of the body. When a hair is about to be shed it separates from its papilla in the hair-follicle and rises in the latter till it reaches above the level of the papillary apex. It is for a time held in place with sufficient firmness by the prickle-layer only, thus forming the bed-hair already described. Later an epithelial bud is projected either into the vacant follicle below or into the corium on either side, from which a new hair is formed, somewhat as the hair is formed in the primitive cone of fœtal life. The subsequent growth outward of the new papillary hair separates the bed-hair from its connection with the prickle-layer, and this filament is shed.¹

¹ Cf. Veneziani, *Giorn. ital.*, 1901, xxxvi., p. 582 (abstr. in *Brit. Jour. Derm.*, 1902, xiv., p. 325).

In studying the mature hairs the parts to be considered are the hair-follicle, and the bulb, shaft, and point of the hair.

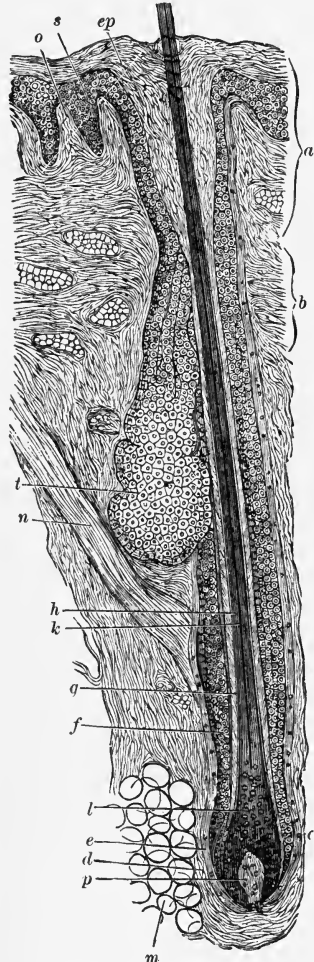
Hair-follicle.—The hair-follicle is a sac-like pouch in the corium, in which depression the hair-filament is implanted by its bulb and

FIG. 11.



Section of a hair-follicle during the formation of a new hair: *a*, external and middle root-sheaths; *b*, vitreous membrane; *c*, papilla with vascular loop; *d*, external root-sheath; *e*, internal root-sheath; *f*, cuticle of hair-follicle; *g*, cuticle of hair; *h*, *i*, young hair; *l*, bulb of old hair; *k*, debris of external root-sheath of hair recently expelled. (After EBNER.)

FIG. 12.



Hair-follicle in longitudinal section: *a*, mouth of follicle; *b*, neck; *c*, bulb; *d*, *e*, dermic coat; *f*, outer root-sheath; *g*, inner root-sheath; *h*, hair; *k*, its medulla; *l*, hair-knob; *m*, adipose tissue; *n*, hair-muscle; *o*, papilla of skin; *p*, papilla of hair; *s*, rete mucosum, continuous with outer root-sheath; *ep*, horny layer; *t*, sebaceous gland.

there firmly secured. The direction of this follicle is always at an oblique angle with the plane of the cutaneous surface upon which it opens, and thus is determined the set of the hairs, which is always

fixed and at a similar angle. Viewed as a whole, the integument of the body over its entire area exhibits determinate whorls of both short and long hairs with definite centres, such as those which may be recognized at the vertex of the scalp, the centres of the lips, the umbilicus, etc. By this disposition the symmetrical appearance of the hairy parts is preserved, and, as a consequence of the same provision, physiological loss of the hair of the head is not productive of deformity, but rather adds dignity to the aspect of the elderly man.

The hair-follicle embraces the lower two-thirds of that portion of the hair which is imbedded in the skin, together with the envelopes of the latter, termed the *hair-sheaths*. Above the sebaceous glands the sheaths of the hair-follicle are lost in the papillary layer. The follicle is constituted of the connective tissue of the corium in three layers: an external longitudinal fibrous layer; a middle transverse layer; and an internal homogeneous or vitreous layer. At the base of the sac a fibrous pedicle may often be traced as low as the subcutaneous tissue.

If the hair-pouch were made artificially by thrusting into the skin from without inward a blunt-pointed pin before which the tissue was gradually pushed, it is evident that the external layer, the stratum corneum, of the epidermis would be the first depressed, and finally would form the inner surface of the pouch. This represents the inner root-sheath of the hair. Next to this the pin would carry before it the mucous layer of the epidermis, which then would form the outer root-sheath of the hair. Outside of both would lie the connective tissue of the corium.

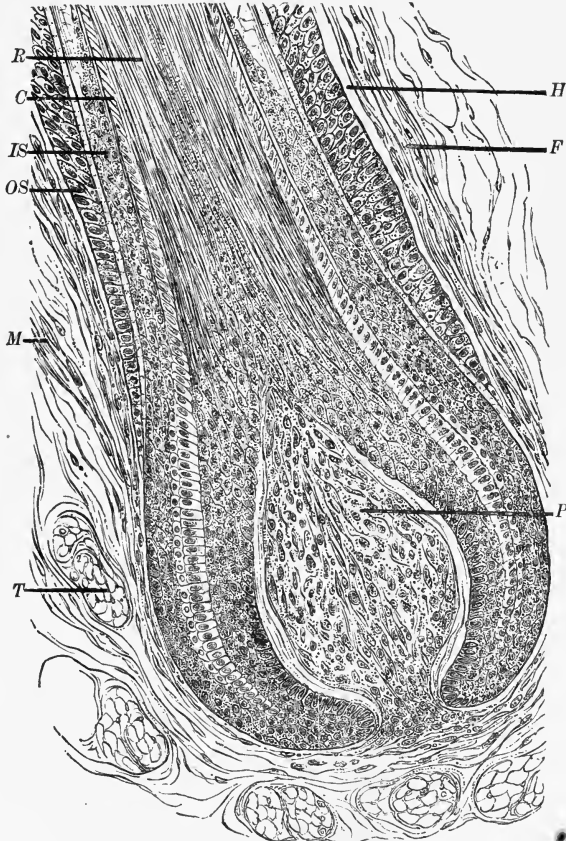
Outer Root-sheath.—The outer root-sheath or the prickle-layer of the hair-follicle, accompanies the involutions of the stratum corneum and the stratum granulosum from without into the funnel-shaped neck of the hair-pouch as far as the openings of the ducts of the sebaceous glands. There, abandoned by the two other layers of the epidermis, the root-sheath is thinned in proportion as the papilla, which rises from below and which it closely surrounds, increases in size. It thus forms a hollow cylinder traversed by the hair and its envelopes, with a relatively wide, external, funnel-shaped opening, only partially filled by the shaft of the hair, and a narrower opening within, which embraces the neck of the hair papilla.

Inner Root-sheath.—The inner root-sheath or “matrix” of the root-sheath, is externally in relation with the outer root-sheath, or prickle-layer, of the hair-follicle. The protoplasm of the cells of which it is constituted contains keratohyalin in varying quantities, the amount being naturally greater in the cells lying nearest the hair-filament. That part of the sheath formerly termed “Henle’s layer” is the more externally situated cellular envelope of this internal root-sheath, and is most conspicuous in that part of the hair-sac above the level of the papilla. That part of the sheath formerly called “Huxley’s layer” is the more internally situated part of the same sheath, somewhat higher in the follicle. These are not distinctly different

structures, but only a single structure in different situations. Whether termed the internal root-sheath or the matrix of the root-sheath, it springs from the neck of the papilla, and rises as high as the neck of the follicle. It contains keratohyalin, which is actively concerned in the cornification of the hair-tissue.

Between this internal root-sheath and the cells constituting the cortex of the hair there is found, according to Unna, the common matrix of the cuticulæ, forming respectively the cuticle of the root-sheath and the cuticle of the hair. The former is composed of cells with their long axes parallel with the circumference of the hair, while

FIG. 13.



Lower portion of hair-pouch from the lip of a kitten: *F*, follicle; *T*, transverse section of connective-tissue bundles of derma; *M*, arrector pili muscle; *IS*, inner root-sheath; *OS*, outer root-sheath; *P*, papilla; *C*, cuticle; *R*, root of hair; *H*, hyaline, or so-called "structureless," membrane. Magnified 500 diameters. (After HEITZMANN.)

those forming the cuticle of the hair are arranged perpendicularly to the surface. These cuticulæ are locked securely together by projection of their cell-edges, while united in the hair-follicle.

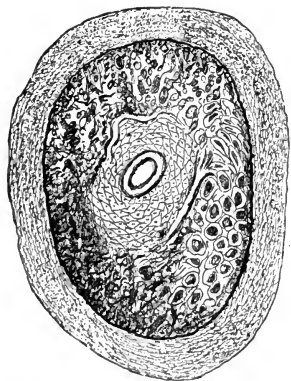
Bulb.—The bulb or the root is that portion of the hair imbedded

in the skin, toward which the shaft of the hair gradually increases in thickness as it descends. The bulb is embraced by the hair-follicle, though its root-sheaths are interposed and implanted below at the base of the sac upon a nipple-shaped prolongation of the corium that may be regarded as analogous to the vascular papillæ of the papillary layer of the corium.

The bulb of the hair embraces the papilla, and is constituted of pigmented cells externally, forming what is called the "cortex" or cortical portion. This is the larger of the two structures of which the hair is composed, and its cells become vertically elongated and narrow as they are pushed outwards in the process of growth.

Shaft.—The shaft of the hair is that portion which extends from the exit of the hair at the surface of the skin to its extremity; the latter, when uncut, always tapers to a perfectly acuminate point, as illustrated by the uncut hairs of the eyelids and those of the lower animals. The hair-shaft is either straight, curled, wavy, or alternately varied in diameter. A transverse section presenting an ovoid or ellipsoidal outline suggests an irregularly compressed circle. The degree of this flattening varies in different races, and is the cause of variability with respect to straightness or curliness. As hairs are to a marked degree hygroscopic, and not only absorb but can be deprived of a portion of their water, these states of waviness are subject to variation according to the aqueous condition of the media by which an individual is surrounded.

FIG. 14.



Transverse section of hair and follicle.

The color of the hair is dependent upon the pigment it contains, the color of the hair cells, and the quantity of air contained in the medulla. Variation in these three factors produces the wide range between a snowy whiteness and an ebony black.

The coloring-matter of the hair is thus stored in both its horny and its medullary portions, and is distinct both within and between the epithelial elements of which the hair is composed. This pigmentation corresponds in great part with the amount of pigment distributed to other parts of the integument, and sustains a close relation to the general nutrition of the body.

Its subjection to the influence of the trophic nerves is well demonstrated by the phenomena of rapid blanching of the hairs. Excessive sweating, whether physiological or induced by the action of pilocarpine, has also a distinct influence upon the shade of color of hair.

The cuticle is the membrane which invests the shaft of the hair, composed of numerous flattened plates, non-nucleated and non-pigmented, regularly overlaid so as to resemble closely adherent fish-

scales when viewed under the microscope on the flat side, and the overlapping tiles of the roof of a house when seen on the edge.

Cortex.—The cortex of the hair, constituting the greater part of its bulk, is composed of flat, nucleated, pigmented, fusiform epidermal cells. The strength, elasticity, and extensibility of the hair are chiefly due to the cortical substance, and in particular to the firmness with which these epidermal cells are attached to one another.

Medulla.—The medulla of the hair is found best developed in the short, strong hairs of the beard and eyelashes, being wanting in the lanugo-hairs. It consists of a loosely packed mass of cuboidal cells with interspersed air-spaces, differing in shape, developed in the centre of the axis of the shaft. This part of the hair contains also the pigment and fatty matters, which are here arranged as in the rete of the epidermis. Seen under the microscope, the medulla appears as a continuous or interrupted longitudinal band extending from the bulb, or the part implanted in the follicle, to the extremity, or point, of the hair. The purpose of this difference in the constitution of the cortex and medulla of the hair is doubtless to insure, on well-known mechanical principles, a maximum of strength, extensibility, and elasticity, with a minimum of volume.¹

GLANDS.

Sebaceous Glands, or sebiparous glands, are pyriform bodies, usually racemose in development, situated in the corium, never in the subcutaneous tissue; they furnish a more or less consistent and fatty secretion destined to anoint the skin and hairs. They can usually be distinguished as of three classes, though only two of these classes include glands which are associated with hairs in the embryo.

The first class includes the sebaceous glands, which, strictly speaking, are appendages of the hairs and hair-follicles. They are developed early in fetal life from minute, lateral, bud-like prolongations from the outer root-sheath of the hair. From two to six of these prolongations spring from the prickle-layer of the hair-follicle, and the prickle cells in the axis of each bud speedily undergo fatty metamorphosis. In the mature gland each acinus is formed of a membrana propria supporting layers of nucleated cuboidal epithelia furnishing fat. Gradually the fatty cells are pushed outward toward the duct of the gland, where, sooner or later, their rupture releases numerous

¹ Pinkus (*Zeitschrift*, 1902, ix, p. 465; *Ibid.*, 1903, x, p. 225) describes peculiar, glistening disks, from 0.25 to 0.5 mm. in diameter, situated adjacent to the lanugo-hairs, and lying in the acute angle formed by the hair with the skin. They are most easily seen, by the aid of strong reflected light, on the flexor surface of the forearm or upper arm, but occur on other parts of the body. They are most numerous in males from eighteen to thirty years of age. Microscopically the structure differs slightly from that of normal epithelium, and by special staining shows a rich supply of nerve-fibrils derived from the nerve of the hair-follicle. These disks have been found in the skin of man only, but resemble closely the touch-plates found in crocodiles and in a peculiar lizard found in Australia. Pinkus believes that these hair-disks play a part in the sensory functions of the skin.

drops of fat (sebum) just where the hair emerges from the closely applied follicle below to the funnel-shaped mouth of the hair-pouch above. Externally each gland is provided with a layer of connective tissue provided with blood- and lymph-vessels and nerves. Sebaceous follicles are found in connection with the long, soft hairs, as those of the scalp and the axillæ; several being grouped around a single hair-sac.

The second class includes the large and complex glandular structures to which the lanugo-, or rudimentary, hairs seem accessory, the orifices of their respective ducts opening directly upon the cutaneous surface. These glands are chiefly found upon the glabrous portions of the skin, as upon the face in both sexes and upon portions of the trunk and extremities.

The third class includes those sebaceous glands, much the smallest in number, opening directly upon the surface and unconnected with hairs or hair-follicles. Such are the *glandulæ odoriferæ* of the male

FIG. 15.

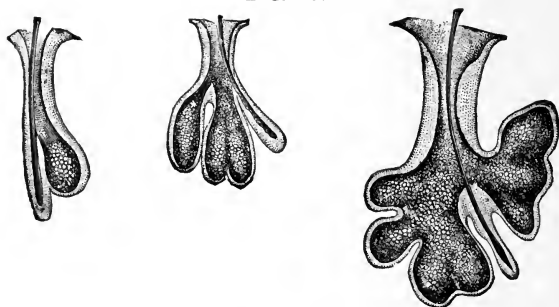
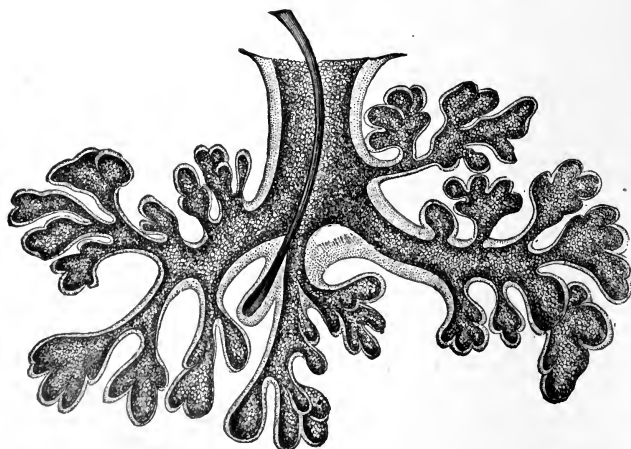


FIG. 16.



Sebaceous glands of the second class, from the alæ of the nose. (After SAPPEY.)

and female genitalia, and those existing about the lips and in the areola of the nipple. These glands might be designated as "glands of the mucous orifices."

Meibomian and Tysonian Glands.—These are of the largest order of sebaceous glands. The former exist within the free border of the eyelids; the latter, upon the glans penis and the inner face of the prepuce. They are unconnected with hairs, and in this respect differ from other types of sebaceous glands.

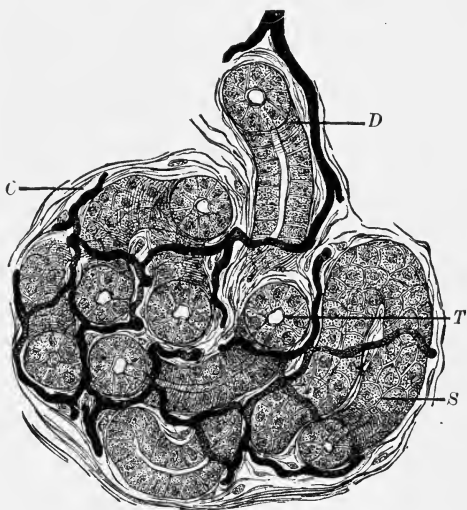
Glandulæ Ceruminosæ.—These are situated in the sebaceous tissue of the meatus of the ear, and contribute to the waxy secretions there furnished. The “glands of Moll” found in the eyelids are to be classed with the sweat-glands.

Coil-Glands.—The coil-glands (*Sweat or Sudoriparous Glands, Glandulæ Glomiformes*), found within the skin of all regions of the body, are globular coils situated in the subcutaneous tissue and in the deeper portions of the corium. They appear first in the fifth month of foetal life as buds projected downward from the prickly-layer of the epidermis. These projections always form between the papillæ of the corium, and spring from the rete-pegs between these papillæ. Long, thin cones of epithelium thus gradually traverse the corium, and become slightly bulbous at the lower extremity to form later the coil. The lumen, when formed, extends rapidly to the epidermis, and after this is reached there is formed from within outward an opening, which becomes the sweat-pore.

After birth these glands are found in all parts of the body, but in certain regions, such as the axillæ, the groins, the palms, the soles, and about the anus, the coil-glands are multiple, of unusual size, and often peculiarly arranged. They are specially numerous in the palms and soles, where, according to Krause, there are between two and three thousand to the square inch.

Coil.—This part is a convoluted tube, of fairly uniform lumen, terminating in a cæcal pouch, lined with nucleated cubical epithelia in a single layer of granular appearance, which are the secretory cells of the gland. Outside of the tube are smooth muscular fibres running parallel with or in a spiral direction about the coil. Surrounding both muscle-bundles and epithelium is a connective-tissue membrane. The glomerulus, or coil, is globular in outline and reddish yellow

FIG. 17.



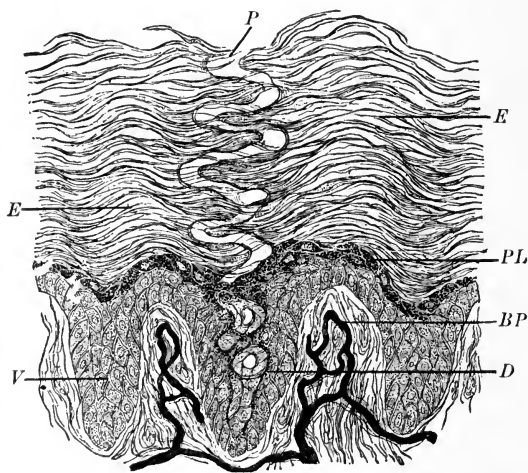
Coil of a sweat-gland; *S*, tubule lined with cuboidal epithelia; *T*, central calibre of the tubule; *D*, beginning of the duct; *C*, connective tissue with injected blood-vessels. Magnified 500 diameters. (After HEITZMANN.)

in color. In the larger glands irregular dilations and constrictions of the tube are conspicuous.

Excretory Duct.—The excretory duct of the coil-gland passes from the glomerulus below to the epidermis above in a straight or a spiral course. It is lined with a delicate hyaline cuticle (discovered by Heynold), beneath which is a double layer of cuboidal epithelium. Externally is a membrana propria, unprovided with muscular fibres. Its outermost sheath is the usual connective-tissue layer. When the duct reaches the border-line of the epidermis, its inner cuticle and external connective-tissue sheath both are lost; here it becomes a sweat-pore. It opens at times within a hair-pouch.

Sweat-pore.—This is a continuation of the excretory duct of the coil-gland after the loss of its cuticle and connective-tissue sheath. It is the loss of these sheaths and the consequent intimate relation of the canal to the epithelia of the epidermis that furnish the special basis for this distinction. The sweat-pore is merely a wall-less canal or channel, spirally directed or running a straight course from the duct of the coil-gland below to the outermost stratum of the epidermis

FIG. 18.



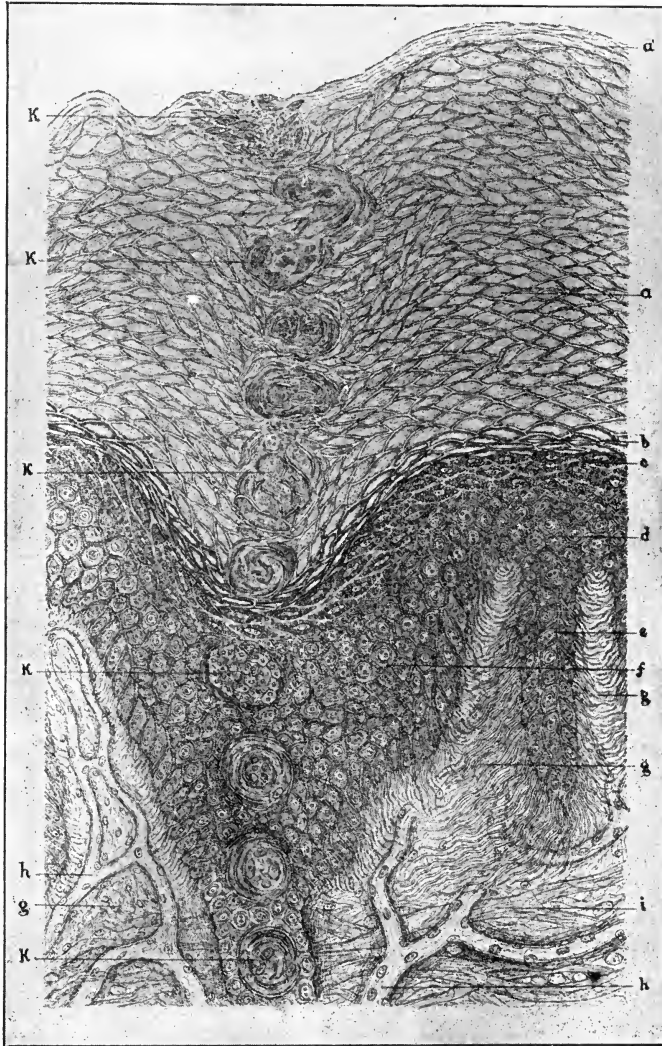
Sweat-pore traversing the epithelial layers of the skin; BP, papilla with injected blood-vessels; V, valley between two papillae; D, duct in the rete mucosum; E, E, epidermal layer; PL, coarsely granular epithelia, deeply stained with carmine; P, duct with cork-screw windings in the epidermal layer. Magnified 200 diameters. (After HEITZMANN.)

above. It has no other wall than that formed by the cells of the prickly-layer below and of the other layers of the epidermis, which successively surround this canal, narrow below and funnel-shaped above. Eleidin-granules are found in the cells which border the sweat-pore at a somewhat lower plane than the stratum granulosum. Hence the lumen of the sweat-pore, if such a term be permissible, is in free communication with the juice-spaces of the epidermis.

Secretion.—The secretion of the coil-glands consists largely of

globules of fat and granules of pigment. The function of the coil-glands, therefore, is plainly the lubrication of the skin with unguent, a task performed only in small part by the sebaceous glands, and by them chiefly for the pilary covering of the body. The palms of the hands and the soles of the feet are thus lubricated with fat by the coil-glands.

FIG. 19.



Section of the skin from the palm of the hand (hardened in Moeller's fluid and treated with glacial acetic acid), magnified 300 diameters, showing epidermis and pars papillaris of the corium traversed by the excretory duct of a coil-gland terminating in a sweat-pore: *a*, stratum corneum; *a'*, its superficial layer, the cells in the upper and lower layers somewhat larger than those situated between the two; *b*, stratum lucidum; *c*, stratum granulosum; *d*, stratum mucosum; *e*, rete-pegs; *f*, interpapillary process of rete meeting duct of coil-gland; *g*, *g'*, papillæ embraced by long prickles extending from lower palisade-layer of the rete; *h*, blood-vessels of papillæ; *i*, bundles of connective-tissue fibres of pars papillaris; *k*, section of spiral duct of coil-gland and sweat-pore.

The total number of coil-glands in the body is estimated to be between two and three millions, and the total length of the uncoiled glands about eight miles. These figures serve to give an approximate idea of their great physiological importance, and of the extent to which violation of the rules of hygiene possesses interest from a pathological point of view.

The function of the sweat-pores which communicate directly with the excretory ducts of the coil-glands is distinct from that of the coil-glands, since it provides for the transmission outward of the watery fluids of the skin. The channel described as the sweat-pore is in ample and free communication with the intercellular spaces of the epidermis; and this anatomical peculiarity provides fully for the needs of evaporation at the surface of the body.

Unna, following in the lines indicated by Meissner, asserts that the coil-glands actually produce the subcutaneous fat-cushion. The coil-glands and the fat-cushion appear at the same period of foetal life and develop in the same proportions. At birth the clusters of fat are most conspicuous where the coil-glands are most numerous. In the adult the coil-glands are often subcutaneous in situation and closely surrounded by fat-globules; while those glands which are not found below the corium, though not thus surrounded, are regularly met by columns of fat advancing toward them from below.

The alternation of muscular fibres with the secretory cells of the ducts of the coil-glands is a provision for the extrusion of the gland-secretion onward. The same anatomical arrangement permits free communication between the epithelia and the lymph-spaces which reach into the connective-tissue sheath of the gland. As a result, the lymph flows freely among the secreting elements of the gland and its duct. This lymph, loaded with fat, streams away from the coils, and before it reaches the lymphatic trunks its fat-globules are filtered away in the subcutaneous tissue.

NAILS.

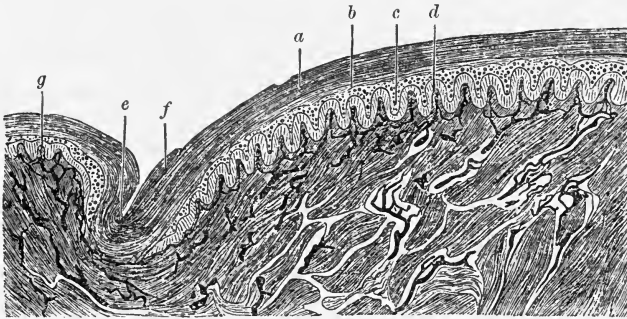
Nails are dense, elastic, and translucent concavo-convex plates, or shells, of horny tissue, placed upon the dorsum of the terminal extremities of the distal phalanges of the fingers and toes. They result from an oblique invagination of embryonal epidermis, with modification of the keratinization-process at the level of the invagination (Darier). Each nail has a free border at the distal portion of the pulp of the digit, with sides and proximal borders let into distinct furrows of the skin. The convex surface of the nail is exposed; the concave, regarding the phalanx, is implanted upon the nail-bed beneath.

In the embryo the first change looking to the formation of a nail consists in a peculiar smoothness and brilliancy of the epidermis covering the dorsum of the distal phalanges. Later, an epithelial ridge or line, with a groove in front of it, traverses the tip of the finger. Thus, three regions are defined: the region behind the ridge, the nail-

wall; that in the groove, the nail-bed; and that in front of the groove, the pulp of the last phalanx of the digit. A group of large prickle-cells at the orifice of the nail-fold soon furnishes the first trace of the rudimentary nail. Mature nail-cells finally push forward between the prickle- and horny layers of the nail-bed, which, by fan-shaped bundles of follicles, is united firmly to the periosteum of the phalanx. Lastly, a thin plate of horny material with a free edge is visible externally in the fingers and toes of the newborn child.

Matrix.—In the adult, what is termed the matrix of the nail is the tissue from which springs the horny plate. The cells of the matrix are cylindricform below and flattened superficially, with a fibrillary structure, and, instead of a stratum granulosum, are supplied with a layer of cells of brownish color charged with a keratogenous substance. The matrix is separated into, first, a posterior

FIG. 20.



Vertical section of one-half of nail and matrix: *a*, nail-substance; *b*, horny layer; *c*, mucous layer; *d*, papillae of corium; *e*, nail-furrow destitute of papillae; *f*, horny layer of the ungual furrow rising above the nail; *g*, papillae of skin of dorsal surface of the finger.

part, filled with from three to six rows of papillae; and next, in advance of this, a lenticular space with curved borders, the anterior limit of which corresponds with the anterior border of the lunula. The area included in these two divisions is provided with papillae grouped in symmetrically converging ridges, decreasing in size as they pass forward. This forms the matrix of the nail.

Nail-bed.—Further forward, the nail-bed proper—in other words the tissue that supports, rather than produces, the horny plate—is composed of higher ridges of papillae, the grooves and summits of which are covered with prickle-cells, and the height of which is uniformly maintained as they stretch forward toward the pulp of the finger.

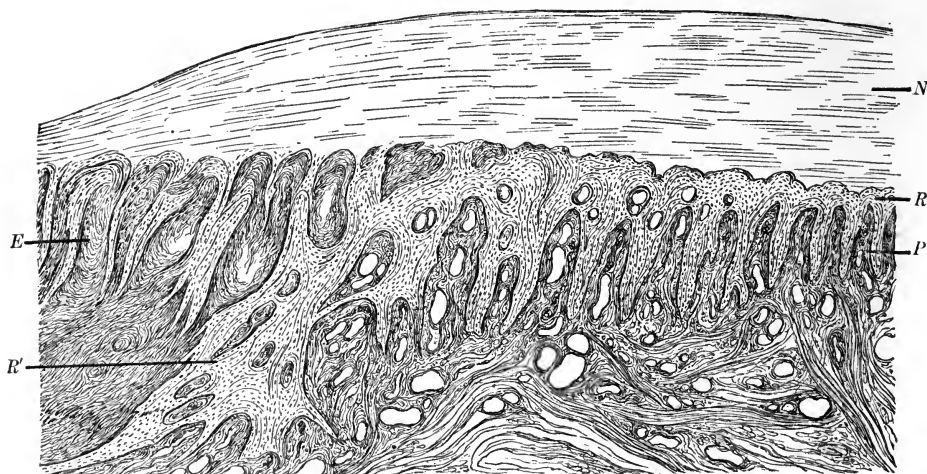
Nail-fold.—The nail-fold, crescentic in shape, clasps the nail posteriorly and laterally. It is formed of connective tissue, the bundles of which are interpenetrated by numerous coil-glands and fat-columns. The epidermis beneath the nail exhibits prickle-, granular, and horny layers. As the nail is gradually liberated from its bed

both at the sides and point the cornification of the horny layer becomes more complete, so that finally, as the nail-plate is pushed forward, it no longer rides over the cells of the rete, but over a completely cornified tissue.

If the pulp of a nail-bearing phalanx be pressed with moderate force against any firm object, the naked eye can detect upon the surface of the nail, just behind its free border, a yellowish-white band, convex anteriorly and somewhat increasing in width laterally. This line is also visible when no pressure is exerted upon the digit, its width varying under the conditions described. This border represents the space in which the three layers of the epidermis from the skin of the point of the finger, viz., the horny, the granular, and the prickle-layer, successively come in contact with the under surface of the nail.

Lunula.—This is the relatively light-colored space extending from the middle part of the nail-fold posteriorly to its well-defined convex border in front. After artificial removal of the nail-fold the lunula is seen to extend to the posterior and enclosed border of the nail-plate. It, therefore, represents that part of the matrix of the

FIG. 21.



Implantation of a nail at its border: *P*, papillæ decreasing in size toward the middle line; *R*, rete mucosum, which broadens toward the border of the nail, and forms irregular prolongations; *R'*, *E*, epidermal layer; *N*, plate of the nail. Magnified 500 diameters. (After HEITZMANN.)

nail not concealed by the nail-fold. Its color is not due to absence of vascularity, but is owing solely to the relative opacity of the keratogenous cells which are concerned in the production of the horny threads that form the nail.

Nail.—The nail (*True Nail*, or *Nail-plate*) originates only from the floor of the nail-fold as far forward as the anterior edge of the lunula. As to its formation, it may, therefore, be imagined as spring-

ing from its matrix vertically in the form of an involuted, shield-shaped plate, its convexity regarding the proximal phalanx. It may then be viewed as pressed downward over its nail-bed in front, with partially unfolded edges enwrapped by the epidermis of the sides, the narrowed point of the shield, elongated when untrimmed, projecting at some distance beyond the tip of the finger.

With this conception it can readily be understood that the nail is constituted of horny filaments, or coherent strata of cornified cells, passing from the matrix or floor of the nail-fold. The upper surface of the nail grows, therefore, from the bottom of the nail-fold; the under surface, from the lunula; and the intermediate layers proportionately from the parts between, that interlock with corresponding grooves on the upper face of the bed.

Unlike the hairs, the growth of the nails, when not modified by traumatism or disease, is continuous and without definite limit during the life of the individual. The growth is from the matrix to the free border, more active in the young than in the old, and in summer than in winter. From one hundred to one hundred and sixty days are required for reproduction of an entire finger-nail, and about three times that period for the nail of a toe. The uncut nail is produced in the form of an elongated, pointed, claw-like talon.

Nails are extremely sensitive to even moderate perversion of systemic nutrition; and either in loss of brilliancy and polish or in deeper structural alterations betray evidence of changes in the health of the individual.

PHYSIOLOGY.¹

The skin through its various component parts renders great service to the body as a whole through performing many physiological functions vital to life. Most important of these is protection, heat-regulation, secretion, sensation, and respiration, the last named only to a small degree. The skin is not simply an inert envelope in which the structures of the body are confined; but is a living organ comparable in importance to the liver, kidneys, and other similar organs.

Protection.—The epidermis is a poor conductor of electricity and light. In the tropics where the light is greatest, the natives are provided with an increased amount of epidermal pigment to screen them from the light. Inhabitants of the temperate zone, while visiting tropical countries require such clothing and shelter as will assist the epidermis in checking light penetration.

The fatty matter in the stratum corneum prevents evaporation of the fluids of the body. The impermeability of the stratum corneum protects other organs of the body from the absorption of water and other fluids. Keratin is a substance which enjoys great power

¹In the preparation of this chapter the following works were consulted: *La Pratique Dermatologique*, Tome I.; Tigerstedt's *Physiology*, 1905; Duhring, *Cutaneous Medicine*, 1896, vol. I.

of resistance to chemicals of all kinds. Resistance to micro-organisms which are normally present in the epidermis and to those also which are pathogenic that find accidental lodgment in the skin, is provided by the impenetrability of the corneous scales, their coherence, and the fatty matter present. The points offering least resistance to their entrance are the glandular orifices. In sweat-glands they are met by an acid secretion (the sweat) exuding from a narrow tortuous canal. The weakest point in the epidermis is the pilo-sebaceous system, where the sebaceous secretion, which is pasty and fatty, offers some resistance. The fibrous corium by its strength and elasticity with the loose fat containing subcutaneous tissue, acts as an ideal support and protective apparatus against external injury of the delicate nerves with their special endings, the blood- and lymph-vessels, the glands, and hair-follicles of these regions. The brain has an extra protection through the abundant hairy growth of the scalp.

Heat-regulation.—In health the temperature of the blood is maintained at near a given point though the body be exposed to temperature changes of wide variation. This is accomplished in the main by the skin through radiation, conduction, and evaporation. When the body is overheated, either from internal or external causes, the blood is determined to the surface-capillaries with loss of heat by conduction and radiation; and at the same time increased activity of the coil-glands is stimulated with outpouring of sweat which by evaporation dissipates such heat. When the body is exposed to cold, the cutaneous capillaries contract, sweat secretion is diminished or stopped, and loss of heat is thus prevented. In addition, heat-loss is lessened through contraction of the arrectores pilorum which occurs when the body is chilled by lessening the exposed cutaneous surface. The vasomotor system regulating the blood supply is intimately concerned in the phenomena above described and apparently may act by direct excitation from without (heat and cold) or reflexly from within by fever, hot drinks, shock, drugs, etc.

Secretion.—The secretory function of the skin is carried on chiefly by the sebaceous and coil-glands. Their office is to furnish oil and moisture to render the skin soft and pliable and to a small degree, give off waste material. They play an important part in the body temperature. The sebaceous glands secrete in health greasy and oily matter (sebum) which anoints the greater part of the cutaneous surface including the hairs. The palms and soles are not anointed by this secretion and they are the only parts which show the effect of water even after prolonged immersion. In the glands, sebum is a fluid or semi-fluid substance which may be of firmer consistency in the ducts, and consists of proteid substances and cholesterin. The expulsion of sebum from the glands to the surface is accomplished largely by contraction of the arrectores pilorum muscles which surround the sebaceous-glands.

Sweat is composed largely (98 or 99 per cent.) of water. It is colorless and has a specific gravity of 1003 to 1008. Its reaction may

be acid, alkaline, or neutral. It has an unpleasant odor and a salty taste. The odor varies according to the part of the body from which it is secreted. Under ordinary conditions it is acid but after profuse perspiration, its reaction becomes neutral or alkaline. The chemical composition of sweat is difficult to ascertain owing to the admixture with material from the sebaceous glands which necessarily cannot be eliminated. The quantity daily excreted is variable and depends largely on the requirements for heat-regulation. The amount in twenty-four hours is probably between a pint and a half and two pints. Urea is ordinarily present in very minute quantity but in certain pathological conditions, such as uremia, may become appreciable in amount. While the entire skin secretes sweat, certain portions such as the brow, face and neck, axillæ, genital regions, palms and soles are the chief areas of such activity. That there is a division of work in excreting water, between the skin and the kidneys is shown by the light color of the urine in winter when perspiration is at a minimum, while the urine is heavy and darker in color in summer when the skin is actively secreting. The sweat secretion is influenced both by reflex and central stimulation. The secretion is increased by elevation of the external temperature, by copious warm draughts, by certain drugs such as pilocarpin, strychnia, camphor, ammonia, etc., and such psychic phenomena as fright, anxiety, etc. It is diminished by external cold and such drugs as morphine and atropin, and in certain pathological conditions such as diabetes. The nervous centres for its regulation are located both in the medulla and spinal cord. The sweat-centres may be stimulated by venous blood caused by dyspnoea preceding death and reflexly by exciting the mucous membranes of the mouth with mustard and other condiments (Halliburton). While increased perspiration occurs as the result of vasomotor dilatation of the vessels in the skin due to heat or muscular activity, it may occur independently of this as is shown in the psychic causes mentioned.

Sensation.—This function of the skin provides a means of protection and discrimination. It was formerly thought that different sensations were awakened by varying degrees and kinds of irritation applied to a single nerve ending. Through the work of Blix (1833) and Goldschneider (1886), it is now known that there is a disassociation of sensation. There are different nerve-endings for heat, for cold, for tactile sense, and for pain.

Temperature Sense.—There are scattered over the surface of the body, certain points which convey only the sensation of cold, whether the irritation be electrical, mechanical, chemical, or by a hot or cold needle. There are other points which transmit only the sensation of heat. Where the tactile sense is more acute, as in the hand, the temperature sense is diminished. The topographical areas of heat and cold must be studied from charts.

Tactile Sense.—This sense is not equally distributed over the surface of the body. It is keenest in the finger-tip and the point of the

tongue. It includes relative perception, with discriminations as to roughness, smoothness, hardness, softness, dryness, and moistness. Relative perception is often an accessory aid to vision. Pressure sense is often increased by the presence of hairs.

Pain Sense.—Where the surface is denuded of epithelium, it is not apt to receive other sensation than that of pain. Pain too is experienced from thermal, mechanical, chemical, or electrical irritation of severe character. There are nerve terminals which receive no other impression than that of pain.

The nature of sensations of itching, tingling, and creeping has not yet been fully determined.

Clinical observation suggests that one of the important factors in the production of itching is pressure on the epidermis. Any inflammatory or serous exudate occurring in just the right location to exert an outward pressure on the epidermis will cause itching. If the exudate is more deeply located, other sensations are experienced. Tingling and creeping sensations are apt to denote deranged enervation.

Respiration.—The respiratory activity of the skin depends on its permeability to gases and vapors in which function it is accessory to the lungs. The manner in which this is accomplished is through a diffusion between the circulating blood in the capillaries and the atmosphere. Physiologically, oxygen is absorbed and some other gases. Water, carbonic acid gas, and a trace of nitrogen are expelled. The respiratory function of the skin is far less in man than in amphibious animals (frog) whose skins are more like a mucous membrane. The skin of these animals cannot be transplanted to man.

II. GENERAL SYMPTOMATOLOGY.

In cutaneous, as in other, diseases the clinical signs or symptoms of a morbid process are those by which a disease is recognized alike by the patient and the physician. These manifestations are divided into subjective and objective: the former are those appreciated by the patient alone in consequence of his sensations; the latter are those detected by the eye and the touch of another who undertakes the investigation of the disease. There are manifested to the eye and touch of the patient many objective signs which are liable to be interpreted or misinterpreted by him, with consequences not to be ignored.

Symptoms of disease of the skin, may be manifested elsewhere than in the integument, as for example in the viscera. The relative importance of the symptoms in the one organ and the other differs greatly in different cases.

SUBJECTIVE SYMPTOMS.

The purely subjective symptoms of a disease of the skin are those manifested to the patient by sensations other than those connected with vision and his own sense of touch. They include sensations of itching, smarting, tickling, pricking, and burning; sensations as of increased or diminished susceptibility to the contact of foreign bodies; of increased or diminished temperature; pain in various grades of severity; and disordered sensations, such as those suggesting the crawling of insects over the part, the passing of currents of hot or cold vapors or liquids, and the compression of portions of the skin as by cords, bands, or closely fitting plates. The character of the subjective sensations experienced by a patient often proves an aid to the physician in recognizing the nature, not merely of a present disease, but also of one which has preceded. Thus, the sensation produced by an attack of erysipelas is rarely an itching, while the latter is highly characteristic of eczema and scabies; the pain of zoster and the tingling of urticaria being distinctly different, not only from each other, but also from the subjective symptoms named above.

OBJECTIVE SYMPTOMS.

The study of the objective symptoms of a cutaneous disease is of paramount importance. In no respect does the skilled physician so distinguish himself from one who is unskilled as in ability to recognize the typical or atypical objective features presented in diseases

of the skin. This study is one which no diagnostician can safely neglect, and its rewards are precious in every department of medical science. These symptoms are spread before the eye, and their legibility increases with every hour of careful observation.

These signs of skin-disease—or, more literally, skin-injury—are called “lesions” (efflorescences, elements of an eruption), and it is usual to classify them as primary and secondary. Such division, however, is open to criticism, since, in point of time merely, some of the so-called “primary lesions” of the skin become in turn secondary and even tertiary. Thus, a papule which might at one time be called “primary,” may be transformed wholly or in part into a vesicle, which thus becomes a secondary lesion, and such vesicle again, in the evolution of a disease, may become a tertiary pustule, and the latter finally may result in a quaternary crust. In the following pages these symptoms of skin disease are distinguished as elementary and consecutive.

ELEMENTARY LESIONS.

In describing the average size of cutaneous lesions it is less convenient to state their measurement in fractions of a line or of a millimetre than to convey an approximate idea by comparison with familiar objects of relatively fixed dimensions. The objects usually selected for this purpose, beginning with the smallest, are seeds of the poppy, mustard, and rape; the coffee-bean; the pea; the bean; the cherry; the finger-nail; the chestnut; the horse-chestnut; the egg of the hen and of the goose; the orange. To these may also be added the point and head of a pin. The student will find it useful to familiarize himself with the size of the small seeds mentioned, that their names may at once suggest to him the relative size of the lesions with which they are compared.

Maculæ.—Maculæ (*spots, stains*; Fr., *Taches*; Ger., *Flecke*) are generally circumscribed alterations in the color of the integument, differing in size, shape, hue, and duration of the dyschromia, and unaccompanied by elevation or depression of the skin-surface.

Macules may be congenital or acquired: and may be the sole cutaneous symptoms present in any case or be commingled with others. They may be transitory or permanent, few or numerous; as minute as a pin-point or as extensive as the integument covering a limb.

Macules may be due to arterial or venous hyperæmia, to the escape of the coloring-matter of the blood into the skin, to acquired and congenital telangiectasis, and to pigment-anomalies. Examples of macules are to be found in the exanthematous rashes (measles); in localized hyperæmia of the capillary plexuses of the corium, disappearing in various degrees according to the pressure exerted on the part (rosacea); in visible acquired development of blood-vessels in the skin (telangiectasis); in congenital vascularization of the surface (nævi); in variously colored blood-extravasations and stases (purpura); in stains produced by contact with dyes (hand-workers in

anilin); and in pigmentary changes such as those produced by solar heat (freckles) or by leprosy.

Extensive non-circumscribed changes in the skin-color are seen in the course of several general disturbances of the economy, as in yellow fever, cancer, chlorosis, albinism, Addison's disease, argyria, and icterus.

Spots of various color and device are also produced by the intentional or accidental introduction of pigmented particles beneath the epidermis, as by the process of tattooing, the explosion of gunpowder, etc.

Maculæ exhibit a wide variation in color from a rosy pink to a chocolate brown or even a black. This difference has suggested the employment of such descriptive terms as roseola, erythema, and purpura, which, unfortunately, serve to distinguish both the features of diseases and the diseases themselves.

A macula which encircles another lesion, as, for example, the halo around a vaccine vesicle, is called an "areola." Linear hemorrhagic streaks are called "vibices"; punctate and larger extravasations of blood are termed "petechiæ" and "ecchymoses."

Maculo-papules are elevated spots which approach the type of the papule.

Papulæ.—Papulæ (*papules*; Ger., *Knötchen*) are solid or compressible, ephemeral or persistent, circumscribed projections from the surface of the skin, varying in size from that of a poppy-seed to that of a coffee-bean.

These exceedingly common skin-symptoms vary greatly in their shape, color, location, career, and significance. Thus, they may be flattened at the apex, acuminate or pointed, conical, rounded, or depressed at the summit to form an umbilication; they may be pale, rosy, dark or lurid red, purplish, or even blackish; they may develop in transitory or persistent processes; they may be transformed into lesions containing fluids; may desiccate and furnish scales either at apex or base; may degenerate into ulcers; or may enlarge into tubercles or tumors; may be scratched, torn, or rubbed so as to lose their typical appearance; may come and go; may be sensitive to sudden changes in the blood-current, and yet be persistent.

The mixed forms described above are generally named vesicopapular or papulo-vesicular, papulo-squamous, papulo-pustular lesions, etc.

Lesions which simulate the papule, and which, though described under that title, really belong to another category, are the small, semi-solid elevations of the surface that form at the orifices of the ducts of the cutaneous glands and follicles. Thus, they may consist of little heaps of epidermis about the hair-follicles (*lichen pilaris*, *keratosis pilaris*), or of inspissated sebum collected in one of, or in all the acini of the sebaceous glands (*comedo*).

The concomitants of an eruption of papular type also vary. Thus there may be a febrile process, or extensive infiltration of the

skin about and beneath the papules (prurigo), or itching of the most intolerable character (eczema papulosum), or production of trifling sensations of annoyance, as a slight burning without other subjective symptoms (acne, lichen planus).

Papules transformed into moist lesions become covered with a crust. Papules scratched or torn by the finger-nails usually betray the fact in the minute and flat blood-scales dried upon their surface. Papules which ulcerate may be followed by scars, and those which have undergone the process of involution may be followed by macular sequelæ.

Pomphi.—Pomphi (*urticæ, wheals*; Ger., *Quaddeln*; Fr., *Plaques ortiées*) are more or less transitory, pinkish, rosy red and whitish, irregular shaped and sized elevations of the surface of the skin, produced by blood-stasis in spasm of the vessels, accompanied by a tingling or a prickling sensation, and characterized by rapidity of evolution and frequency of recurrence.

The typical wheal is seen in the disease known as "nettle-rash" (*urticaria*), in which closely packed, shining, roundish, and whitish pea- to finger-nail-sized elevations of the skin are visible, surrounded by a slightly rosy border. Wheals are firm to the touch, and arranged in patches, circles, bands, gyrations, or striations, often disappearing in a brief time and recurring with or without a renewal of the cause. They are occasioned by a rapid exudation of serum into the rete or pars papillaris of the corium. This is due to clonic vascular spasm, producing irregularities in the lumen of the skin-capillaries, under the influence of the vasomotor nerves which supply a small area of the superior pars vascularis of the derma. The sensations produced are stinging, burning, prickling, and itching. Wheals are often surrounded by an areola.

"Giant"-wheals are such as have the dimensions of a hen's egg, or cover extensive areas of integument, as, for example, the entire surface of a buttock or a shoulder.

Relics of disappeared wheals are usually transitory erythematous maculæ, but in rare cases there is left a more or less deep pigmentation which slowly disappears (*urticaria pigmentosa*).

At times the wheal-like condition is assumed by papillæ, as also by lesions resulting from such traumatisms as the bites of insects, reptiles, horses, dogs, etc.

Tubercula.—Tubercula (*tubercles, nodules*; Ger., *Knoten*) are circumscribed, solid, generally incompressible and persistent nodosities of the skin, varying in size from that of a coffee-bean to that of a cherry.

Tubercles occurring in diseases of the skin bear no relation to the lesions having the same name which develop in pulmonary tuberculosis. The dermatological title relates chiefly to the size of the lesion.

Tubercles may be projected largely from the free surface of the integument, or be deep seated in the skin, and but a small portion

become evident in the view externally. Their variations as to shape, color, size, slowness or rapidity of development, and other features correspond in great part with those described in connection with papules. They may be attached by a broad base to the skin, or be pedunculated, or even pendulous. Their seat is usually in the deeper portions of the corium or in the subcutaneous connective tissue. Degenerating and ulcerating tubercles are followed, as might be supposed in view of their volume, by considerable destruction of tissue, and correspondingly in cases of repair by extensive cicatrices. Tubercles are seen in such diseases as fibroma, molluscum epitheliale, syphilis, leprosy, sarcoma, and cancer.

Tubercles are often described as merely enlarged papules, but the distinction between these two forms of lesions will better be recognized when attention is paid to the particular portion of the skin in which each takes its origin. Many tubercles are pure neoplasms; others may be hypertrophies. Papules spring oftenest from the superficial layers of the derma; tubercles, from the deeper layers. At times a tubercle may project from the surface to a less extent than a papule, though its larger volume is evident as soon as the skin within which it has developed is handled.

Tubercles due to a cellular infiltration may cease to be circumscribed, and by coalescence furnish a diffuse involvement of both the skin and the subcutaneous tissue.

Papulo-tubercles are transitional forms assignable to either of the two lesions named.

Phymata.—Phymata (*tumores, tumors*; Ger., *Geschwülste*; Fr., *tumeurs*) are masses of soft or solid tissue, or of solid tissue more or less commingled with fluids of variable consistency, differing in size, shape, color, and in the benignity or malignity of their career, located either within or beneath the skin, or, being attached to the skin, projecting from it to a variable extent.

The mere fact that a lesion of the skin approaches in dimensions the size of a tumor is in itself an element of gravity. Tumors may originate in mere hyperplasia of the living matter; may consist of new formations of greater or lesser danger to the vicinage or to the general economy; may be formed of blood-vessels or of lymphatic vessels, or of both in the same lesion; may embody large fluid-containing cysts; may be built up of nerve-tissue, fat, bundles of connective-tissue fibres, glandular elements, and indeed of any of the elements which exist physiologically in the human integument. Tumors vary in size from a walnut to masses of enormous volume and weight. They may be pinkish, reddish, brownish, or even black in hue, and may be covered with a tense or flaccid extension of the integument.

Examples of tumors are seen in fibroma, sarcoma, carcinoma, and rhinoscleroma.

Vesiculæ.—Vesiculæ (*vesicles, phlyctenæ, phlyctenulæ*; Ger., *Bläschen*) are acuminate, rounded, or flattened elevations of the horny

layer of the epidermis with limpid, lactescent, or sanguinolent fluid contents, varying in size from that of a poppy-seed to that of a coffee-bean.

Typical vesicles are seen in the minute, transitory lesions occurring in the vesicular form of eczema. They may be discrete, grouped, transitory, or for days persistent. They may be developed from papules. They are usually filled with a clear serum. Variations from this type, however, are common. Thus, they may be either flattened, acuminate, roundish, umbilicated, or conical; may be fully distended or partially collapsed upon their contents; may have a short or long duration; may be distended with a milky, chylous, or blood-stained fluid; may be opalescent, yellowish, reddish, or blackish in color; several may coalesce to form a many-chambered bulla. One or several may undergo transformation into pustules or bullæ. Vesicles may terminate by accidental or spontaneous rupture, their contents freely flowing forth upon the surface of the peripheral integument; or they may desiccate to a crust; or may even terminate by one of the ulcerative processes. They may or may not be accompanied by pruritus. Minute vesicles, which are merely the external apices of large-chambered accumulations of fluid beneath, occasionally form upon the surface of the skin. Such are seen in the course of lymphangiectasis. Vesico-pustules and vesico-bullæ are intermediate forms of elementary lesions representing the types designated by these names.

Pustulæ.—Pustulæ (*pustules*; Ger., *Pusteln*) are circumscribed cutaneous abscesses, covered with an epidermal roof-wall, and varying in size from that of a millet-seed to that of a filbert.

The typical pustule contains pus, and is colored yellowish, yellowish-green, or brownish-green, according to the admixture of its contents with blood. The pus being an inflammatory product, necessarily indicates the occurrence of an inflammatory process at the base of the pustule. Pustules, like vesicles, may be roundish, acuminate, globoid, conical, or umbilicated, and surrounded by an inflamed or normal integument; may be superficial or be deep-seated; may terminate by rupture or by desiccation; may or may not be followed by an ulcer and ultimate cicatrix. They may be seated either upon the free surface of the skin, or at an orifice of a follicle, in which case they represent an inflammation with purulent product in the duct or the gland beneath.

Pustules may originate as such, or as a consequence of transformation of vesicles, or after a change in a papule, which may thus come to have a purulent apex. According to Auspitz, they invariably originate from vesicles. Pustules often result in the formation of crusts, the latter varying in color according as the pustules from which they originated contained clear serum or blood.

Transitional forms between vesicles and pustules and papules and pustules are termed, respectively, vesico-pustules and papulo-pustules. Pustules of a large size, resting upon an indurated, engorged, and elevated base are often called "ecthymatous."

Pustules are seen in syphilis, variola, eczema, scabies, acne, and many other cutaneous diseases, including several forms of dermatitis medicamentosa. Many contain pus-cocci; some furnish a "neutral," or pseudo-pus destitute of micro-organisms.

Bullæ.—Bullæ (*blebs*, "*blisters*"; Ger., *Blasen*) are superficial or deep-seated elevations of the skin having fluid contents, differing in color, shape, and career, and varying in size from that of a coffee-bean to that of a goose-egg.

Blebs have been described as large vesicles; but this fails to define exactly their pathological character. Like vesicles, they may contain serum, lymph, blood, or pus, and may variously be colored according to the degrees in which their contents become visible through a semi-transparent roof-wall. They may be globoid, hemispherical, oval, crescentic, semi-crescentic, or conical, and may even exhibit angles. They may be seated upon an apparently unaltered or an evidently morbid integument; and may or may not present a peripheral areola.

Bullæ may persist or may rupture; may desiccate or may degenerate into ulcers; may collapse after the escape of their contents, and the roof-wall become glued to the base from which it was originally raised. Bullæ usually occur in extremely debilitated states of the system, and are, as a rule, of graver portent than other fluid-containing lesions of the skin. They occur in scalds and burns, in pemphigus, leprosy, erysipelas, syphilis, and moist gangrene.

CONSECUTIVE LESIONS.

Squamæ.—Squamæ (*scales*; Fr., *Squames*; Ger., *Schuppen*) are attached or exfoliated epithelial lamellæ which have become appreciable at the surface as the result of some morbid process in the skin.

There is constantly in progress over the superficies of the body physiological desquamation, the evidences of which are not pronounced in skins properly cleansed by ablution. In morbid processes, however, desquamation may occur as a distinct symptom in various forms. Thus, the scales may be minute, fine, branny, dirty white, or yellowish; they may be large, pearly white, shining; may be dry or fatty; may be aggregated so as to resemble flaky pie-crust; may exfoliate in extensive sheets, as from the entire sole of the foot or the palm of the hand, or in glove-finger-like sheaths, as from the surface of a digit; they may be scanty, scarcely perceptible, and so firmly attached as to require force for their removal; they may fall spontaneously in a pulverulent shower, being so abundant as to encumber the garments or the bed-clothing of the patient.

Furfuraceous or pityriasic desquamation is that form in which fine, bran-like scales are shed from the surface.

Scales are frequently intermingled with other lesions, often succeeding the latter. Thus a papule may scale at its apex, or surround its base with a collarette of loosened epidermal plates, beneath or between which a macular stain is visible. Again, scales may develop

from macule, tubercle, or tumor. Though generally conceded to be evidences of a dry and non-discharging disease of the skin, they are at times accompanied or succeeded by moisture of the part affected.

The term *scales* is sometimes applied to the flattened plates of dried sebum that form on the scalp and on portions of the trunk in *seborrhœa sicca*.

Scales occur in eczema, psoriasis, pityriasis, ichthyosis, syphilis, and in several of the parasitic diseases of the skin.

Crustæ.—Crustæ (*crusts*, “*scabs*”; Fr., *Croûtes*; Ger., *Krusten*, *Borken*) are relics of the desiccation of pathological products of the skin.

Crusts usually contain epithelial débris and scales, and may be compounded with loosened hairs and foreign particles. Crusts never occur as primary symptoms of disease. When formed by the desiccation of serum only, they are of a yellowish, straw-yellowish, or reddish-yellow hue; when composed largely of dried pus they are colored greenish or greenish-yellow; and when there has been an admixture of blood they are usually brownish or blackish. At times they suggest in appearance gum, honey, or Venice turpentine; in shape they may have the form of the concavo-convex lid of a watch-case; in color and shape they may resemble the half-shell of an oyster or the carapace of a small turtle. They may be delicate and thin, bulky and thick, friable or mealy; may be firmly attached to the subjacent tissues or readily separable; may cover a sound though tender and reddened epidermis; may conceal a superficial or a deep, foul-based ulcer, by secretions from beneath which they are raised above the plane of the skin and increased in thickness; they may be circumscribed and no larger than a small finger-nail; may envelop an entire limb or organ, as the leg or the penis; or, finally, may be so irregularly disposed among other lesions—papules, pustules, excoriations, and open ulcers—that it is difficult to define their outline, or even to recognize their identity. Crusts formed of dried sebum are greasy to the touch, dirty yellowish in shade, and usually seated upon a non-infiltrated base.

Crusts are common in eczema, syphilis, leprosy, *seborrhœa*, and in a large number of other diseases of the integument.

Excoriations.—Excoriations (*abrasions*, *erosions*; Ger., *Hautabschürfungen*) are superficial solutions of continuity, usually involving portions of the skin affected with pruritus, and resulting from mechanical violence.

Excoriations, in appearance among the most trivial of skin-lesions, possess a value from the diagnostic point of view which can scarcely be overestimated. They occur as striated, linear, punctate, circular, or irregularly shaped, furrowed wounds, at times involving areas of flat surface, oozing with serum or blood, covered with dried blood or crusts, yellowish, blackish, or reddish in hue, and for the most part both induced and accompanied by severe pruritus. They may coexist with hyperæmia and infiltration of the skin beneath, brought on by

the irritative character of the continuous, or, more frequently, interrupted, cause by which they were begotten.

Excoriations become significant according as they indicate scratching, tearing, or other species of wounding by the finger-nails, and the rubbing or piercing of portions of the integument with foreign bodies. In the former case they are significantly recognized in those portions of the body most accessible to the hands, though in the case of eczematous children and infarcts they may originate by the rubbing together of the knees, or the rubbing of one leg by the feet and toes of the other leg. The loss of tissue may extend deeper than the rete, at times invading the papillæ of the corium, which bleed in consequence. Scars rarely result from any save the deepest excoriations.

Excoriations may occur without the appearance of other lesions, as in the disease called "pruritus"; but where itching is severe and induced by a cutaneous exanthem, the lesions constituting the latter may be intermingled with, obscured by, or even obliterated by excoriations and the pathological processes to which they give origin. Thus, macules, vesicles, pustules, and papules may undergo change; and the recognition of the type of the existing disease may correspondingly be difficult. Excoriations are common in skins wounded by lice, bed-bugs, and gnats; in the subjects of eczema, scabies, intertrigo, and prurigo; and in individuals with special sensitiveness of the integument to the action of a medicament employed either internally or externally.

Excoriations which occur after long-continued and persistent traumatism of the skin may be the seat of secondary infection with a purulent product, may become the seat of a severe inflammatory process, may be surrounded with a vivid halo of redness, may be seated upon a dense infiltration and may result in dense pigmentation of the skin.

Rhagades.—Rhagades (*fissures, cracks, rimæ*; Ger., *Hautshunden*) are linear solutions of continuity, usually occurring in previously infiltrated portions of the skin.

Fissures may extend to the derma, and invade yet deeper structures; may be painful or the reverse; may be dry, secretory, or incruusted; are often hemorrhagic; and usually are formed with sharply cut walls. They are of frequent occurrence in the vicinity of the mucous outlets and articulations, in which situations they are induced or aggravated by movements stretching or tearing tissue the extensibility of which has been diminished by any morbid process. Fissures may terminate in ulceration; they vary as to length, curve, and tenderness; they are often exquisitely painful, and greatly complicate the skin-disease in which they form; they may follow the curve traced by the boundaries of bodily organs near which they occur—as, for example, the line of the posterior junction of the ear with the head, or that of the breast of a woman with the thoracic wall upon which it rests.

Fissures occur in eczema, syphilis, dermatitis, and lichen ruber.

Ulcers.—Ulcers (*ulcers*; Ger., *Geschwüre*) are losses of substance resulting from a previous pathological process involving the corium, and, in some cases, the subcutaneous tissue.

Cutaneous ulcers differ greatly in size, shape, color, edges, base, career, and, indeed, in all their characteristics. Every ulcer has an outline, a base, a floor, edges, and a secretion. The outline may be circular, crescentic, reniform, ovoid, serpiginous, or with horseshoe-like contour. The base, or underlying tissue, may be soft, supple, indurated, or in a state of active inflammation, with consequent infiltration. The floor may be glazed, shallow, deep, excavated, cup- or funnel-shaped, "worm-eaten," crateriform, sloughy, covered with a tenacious or a readily removed secretion, granular, puriform, or hemorrhagic. The edges may be clean-cut, having a punched-out appearance, undermined, everted, ragged, irregular, or contracting, with a whitish inner border of advancing cicatrization. The secretion may be scanty, limpid, puriform, profuse, ichorous, and odorless, or exhale an offensive stench. Ulcers may be so crust-covered as to be invisible, or so exposed and erosive in action as to render the affected surface in the highest degree unsightly. They may be acute or chronic, insensitive or productive of intense pain; may heal by cicatrization, remain open for a lifetime, or prove fatal either by destruction of parts essential to life or by exhaustion of the vital forces. Ulcers may result as a consequence of a vast number of morbid processes, including traumas, systemic affections (syphilis, leprosy, lupus, carcinoma), varicose veins of the lower extremities, hypostatic congestion (bed-sores), and in cases of general debility with impaired resistance. Ulcers terminate after healing with cicatrization.

Cicatrices.—Cicatrices (*scars*; Ger., *Narben*) are new-formed substitutes for lost connective tissue.

Scars never succeed excoriations, fissures, or other solutions of continuity in the skin that have not penetrated as far as the derma and resulted in destruction of a portion of the elements of which the derma is built up. They possess the highest importance for the diagnostician, since they point invariably to a pathological process the career of which is terminated, the characteristic features of which termination they frequently embody. They may be regarded as the special and persistent imprints upon the integument, of the serious disorders from which it has suffered.

To a certain extent, as already shown, scars retain traces of the special peculiarities of the lesions, and even of the diseases, which they succeed. The identification, however, of the individual predecessor in each instance is, in the present state of our knowledge, not always possible from a study of cicatrices alone. The extent of knowledge in this direction, however, is rapidly increasing; and in many cases the certainty thus acquired is of incalculable value to the diagnostician.

Scars are remarkable for their tendency to contraction and gradual decoloration. They may be minute, punctate, extensive in area,

attached to underlying tissues, depressed, raised above the plane of the peripheral skin, seamed with furrows, pliable and soft, indurated, traversed by ridges, knotted, or as irregular in contour as the ulcers already described. They may extend in digital, linear, or annular prolongations toward contiguous portions of the skin; and by subsequent contraction induce considerable distortion and deformity. Thus, they may drag down an eyelid, and ectropion ensue; may glue the lobe of an ear to the cheek; may evert lip or nostril. When recent they are usually reddish in tint; when older they may be pigmented in centre or at circumference; or, as is common, may exhibit a gradual decoloration centrifugal in progress. They may be the seat of pain from an entrapped nerve-filament; may reopen to ulceration; or may be unaccompanied by subjective sensation. Not rarely they become the source of keloid. Scars are unprovided with hairs, papillæ, or the orifices of sweat-pores and sebaceous gland-ducts. As implied in the definition given above, scars may result from any disease or injury of the skin that involves loss of connective-tissue elements in the corium.

UNCLASSIFIED LESIONS.

To the several lesions defined above Bazin adds, as elementary forms, the mucous patch of syphilis, the cuniculus, or furrow, produced in the skin by the *Acarus scabiei*, and the sulphur-colored crusts of favus. Among the elementary lesions of the skin, Brocq includes the gumma, or firm, deeply situated, often subcutaneous mass commonly degenerating centrally rather than, as may the tubercle, from without inwardly; while among the consecutive (so-called "secondary") lesions of the skin the same author considers "lichenization" or "lichenification." These are terms chiefly employed by French writers to designate the changes in the skin produced by long-continued external irritation, the thickened and infiltrated integument assuming a yellowish-brown or reddish-brown tint, the exposed surface being studded with pinhead, pin-point, or slightly larger, shining and flattened isolated elevations, with delicate furrows separating each from the other. These, however, are not general, but special features of individual disorders, and are best studied in connection with the latter.

The elementary lesions of the skin are termed by Auspitz *anthemata*; groups of such lesions, *synanthemata*; and, in accordance with common usage, generalized eruptions affecting the entire surface of the body, *exanthemata*. The word *erythanthema* is used to describe groups composed of several of the elementary lesions of the skin, as, for example, of papules, vesicles, and pustules, rising from a common reddened and hyperæmic base.

In addition to the names of the lesions of the skin just enumerated, certain peculiarities of cutaneous symptoms are described in qualifying terms which require definition. They relate chiefly to the color, shape, distribution, and method or period of evolution of

lesions as they are observed in individual cases. The more important of these terms, as used by modern writers, are alphabetically arranged below, with a brief explanation appended to each.

- ABDOMINALIS. Located on the abdominal surface.
 ACQUISITUS. Acquired.
 ACUMINATUS. Having a pointed apex.
 ACUTUS. Of acute course.
 ADULTORUM. Occurring in adult years.
 ÆSTIVALIS. Occurring in the summer season.
 AGGREGATUS. Collected in patches.
 AGRIUS. Acute, or angry in appearance.
 ALBIDUS. Of whitish color.
 ANGIECTATICUS. Vascularized.
 ANNULATUS. } In the form of a ring.
 ANNULARIS. }
 APYRETICUS. Unaccompanied by fever.
 AREATUS. Occurring in areas.
 ARTIFICIALIS. Producing artificially.
 ASYMMETRICALIS. Of different distribution on the two lateral halves of the body.
 AUTUMNALIS. Occurring in the autumn.
 BRACHIALIS. Occurring on the surface of the arm.
 CACHECTICORUM. Occurring in debilitated subjects.
 CAPITIS. Occurring on the head, usually the scalp.
 CAVERNOSUS. Large chambered.
 CHRONICUS. Chronic in course.
 CIRCINATUS. Of circular outline.
 CIRCUMSCRIPTUS. Having a definite contour.
 CONFERTUS. } Arranged in close proximity, with coalescence of lesions.
 CONFLUENS. }
 CONTAGIOSUS. Capable of transmission by contagion.
 CORPORIS. Occurring on the surface of the body; employed usually to designate an eruption upon the trunk, as distinguished from that on the head or the extremities.
 CRUSTOSUS. Crusted.
 CRYSTALLINUS. Of crystalline appearance.
 DIFFUSUS. Irregularly disposed.
 DISCRETUS. Having isolated lesions.
 DISSEMINATUS. Disseminate; without regularity of distribution.
 ERUPTION. Is used of the totality of all patches and lesions upon the person of one individual.
 ERYTHEMATOSUS. Having a reddish blush.
 ESSENTIALIS. Idiopathic.
 EXFOLIATIVUS. Having a tendency to exfoliation or shedding of scales from the surface of the body.
 EXULCERANS. Exhibiting lesions with a tendency to superficial ulceration.
 FACIALIS. Located on the face, usually as distinguished from the scalp.
 FAVOSA. Displaying crusts of favus.
 FEBRILIS. Accompanied by a febrile process.
 FEMORALIS. Occurring on the surface of the thigh.
 FIBROSUS. Composed of fibrous tissue.
 FIGURATUS. Having a figured appearance.
 FLAVESCENS. Of yellowish hue.
 FOLIACEUS. Resembling a leaf or leaves.
 FOLLICULARIS. Concerning the cutaneous follicles.
 FUNGOIDES. Resembling a fungus.
 FURFURACEUS. Exhibiting numerous fine, bran-like scales.
 GUTTATUS. Of the size of a drop of water.
 GYRATUS. Having a serpiginous or gyrate outline, which is usually the result of a coalescence of imperfect circles or semicircles.
 HERPETIFORMIS. Vesicular or herpetic in type.
 HIEMALIS. Occurring in the winter season.
 HUMIDUS. Accompanied by moisture.
 HYPERTROPHICUS. Characterized by hypertrophy.

- HYSTRIX.** Having lesions projected or erected like quills.
IMBRICATUS. With crusts or scales overlaid like tiles.
IMPETIGINODES. Pustular.
INFANTILIS. Occurring in infancy.
INTERTINCTUS. Distinguished by color.
IRIS. Occurring in more or less distinctly defined concentric rings.
LABIALIS. Occurring upon the surface of the lip.
LENTICULARIS. Of the size of a small bean.
LIVIDUS. Deeply colored.
MACULOSUS. Discolored.
MADIDANS. Characterized by moisture.
MARGINATUS. Having a defined margin.
MEDICAMENTOSUS. Produced by external or (more commonly) internal medication.
MELANODES. Of blackish color.
MILIARIS. Of the size of a millet-seed.
MITIS. Of mild, benignant type—the reverse of agrius.
MULTIFORMIS. Exhibiting simultaneously several types of elementary lesions.
NEONATORUM. Occurring in the newborn.
NEURITICUS. Having nervous association.
NIGRICANS. Of a black or blackish color.
NODOSUS. With development of nodes or tuberosities of the surface.
NUMMULARIS. Of the size of small coins.
OLEOSUS. Accompanied by an oily secretion.
PALMARIS. Occurring on the palms.
PARASITARIUS. } Produced by an animal or a vegetable parasite.
PARASITICUS. }
PATCH. The aggregation of several isolated or confluent lesions.
PHLEGMONOSUS. Accompanied by deep-seated inflammation.
PHLYCTENOIDES. Characterized by groups of small vesicles.
PIGMENTOSUS. Accompanied by pigmentation.
PILARIS. Related to the hair.
PLANTARIS. Situated on the soles of the feet.
PLANUS. Flat.
POLYMORPHOUS. The Greek equivalent of the Latin *multiform*.
PRÆPUTIALIS. Situated upon the prepuce.
PROGENITALIS. Situated upon the exposed mucous surfaces of the genitalia.
PRURIGINOSUS. Accompanied by itching.
PUBIS. Located upon the skin or hairs of the pubes.
PUNCTATUS. Occurring in dots or points.
RHAGADIFORMIS. Fissured, or tending to produce fissures.
ROSACEUS. Having a rosy or pinkish hue.
RUBER. Red; usually dark red in color.
SCUTIFORMIS. Having the shape of a shield.
SEBACEUS. Concerning the sebaceous glands or their secretion.
SENILIS. Occurring in advanced years.
SERPIGINOSUS. Literally, creeping; advancing in irregular gyrations.
SICCUS. Dry; unaccompanied by moisture.
SOLITARIUS. Exhibiting an isolated lesion, or with isolated lesions.
SYMMETRICALIS. Similarly distributed on the two lateral halves of the body.
TOXICUS. Poisonous.
UNIFORMIS. Exhibiting lesions all of one type.
UNIVERSALIS. Affecting the entire surface of the body.
URTICATUS. Accompanied by wheals.
UTERINUS. With association of uterine disorder.
VARIEGATUS. Exhibiting several distinct colors.
VASCULOSUS. Accompanied by vascular development.
VERNALIS. Occurring chiefly in the spring of the year.
VERSICOLOR. Exhibiting several shades of the same color.
VULGARIS. Of the usual or commonly observed type.

III. GENERAL ETIOLOGY.

THE study of the causes of skin-diseases gives a glimpse of the etiology of diseases in general. In the lowest representatives of life the greatest dangers to existence originate in exposure to assault from other and stronger representatives in search of their prey—in other terms, an external danger. In man, the highest representative of the animal scale, the perils of existence are complicated by his social necessities and his artificial methods. He can never, however, at any period of his existence, divest himself from the necessity of exposure to external peril. The plan of his organs and the play of his normal activities are perfect, even to the recovery from all but mortal injury and repair of moderate loss. The struggle for existence of the ideal man is intended to be with that which is without; his body meanwhile furnishing him with a comfortable tenement and a fair fortress. In the purview of nature there should be no internal revolt. When such occurs it is usually the result of his ignorance, his folly, or his vice.

Viewed comprehensively the causes of diseases of the skin are seen to be numerous; extremely different from each other; some effective singly, others either alone or in combination with similar or different agencies; some operating slowly, others rapidly; some operating from within the body, others from without; some directly, yet others only very indirectly, exerting their forces upon the integument. The results are as diverse as the causes themselves. Some dermatoses produced by a single cause are similar in symptoms; others, originating from like causes, present scarcely the slightest resemblance to each other. It is from a study of this interesting field that much of the experience of the diagnostician is derived.

For convenience of classification, it is well to consider the causes of diseases of the skin: first, as internal agencies; secondly, as external agencies; thirdly, as agencies which modify diseases produced by any of the original factors capable of their production.

INTERNAL CAUSES.

Heredity.—Some cutaneous disorders, such as syphilis, are capable of transmission to a second generation. The prevalent doctrines, however, respecting the inheritance of a large number of cutaneous affections are without question erroneous. Still the fact remains, that whether keratosis, psoriasis, and some other diseases not recognizable at birth (as may be the lesions of syphilis), are at times the result of inheritance, it is certain that a predisposition to diseases of many kinds is perhaps in the majority of cases transmitted

to a second generation. The weakness or vulnerability of a given organ of the body renders it especially liable to external or internal sources of damage, and may be strictly inherited.

Sex and Age are not to be regarded as effective in the production of diseases of the skin, but some of the latter are conspicuously exhibited at certain periods of life, and others, in preponderance or exclusively, in individuals of one sex. Thus the several forms of rosacea are more common in middle life; carcinoma in later years; hydroa vacciniforme and contagious impetigo in children; diseases of the nipple almost exclusively in women; and the trade dermatoses largely in men.

Visceral and Constitutional Disorders.—The group of affections commonly included in the language of the schools as within the field of “inner medicine” furnishes a large list of causes effective in the production of cutaneous maladies. Among visceral disorders may be named those of the kidneys (Bright’s disease, albuminuria, diabetes), giving rise to pruritus, angioneurotic œdema, eczema; of the uterus, giving rise to certain pigmentary changes in the skin; of the central or peripheral nervous system, as in urticaria, herpes, hemiatrophia, pruritus, alopecia; of the alimentary canal, producing eczema, acne, urticaria, etc.; of the adrenals, as in morbus Addisonii; and of the stomach, as in several of the gastric dyspepsias, which are capable of producing urticaria, erythema, acne, and rosacea.

Among the constitutional affections capable of originating disorders of the skin may be named glycosuria (apart from renal diabetes), which may be productive of glycosuric xanthoma; syphilis, which is responsible for an extended list of dermatoses; gout and rheumatism, which influence to a remarkable degree the oncoming of certain eczemas of the anal and other regions, multiform erythema, acne rosacea, and purpura; and disorders of the respiratory tract, some of which (*e. g.*, asthma) are well known to have a distinct relation to eczematous outbreaks, with which their attacks may alternate.

Nervous System.—This may be responsible for a number of dermatoses. The nerve-centres, nerve-trunks, and nerve-terminals may largely influence inflammatory, congestive, and atrophic states; cerebral, spinal, and sympathetic nervous changes (trauma, new-growths, simple inflammatory thickenings, etc.) may be directly or indirectly concerned in attacks of pemphigus, zoster, scleroderma, urticaria, hyperidrosis, alopecia, and even grave ulceration of the skin. Pigment-changes in the skin and its accessories (hair and nails) have been produced by such causes.

Psychical perturbations, as in the shock following traumatisms, terror, bereavement, great and prolonged anxiety, and even the excitements of success in war and business, have a demonstrable effect both on the nutrition and color of the skin and of the hairs and nails, as well as in the production of exanthemata, such as bullæ, vesicles, and several types of dermatitis. In the same connection may be named the results of maternal impressions upon the fœtus, which,

among the ignorant and to an extent also among men of science, are believed to be responsible for so-called "mother's marks," including pigmentary, papular, and vascular *nævi*, as well as the larger lipomatous tumors associated with hairy moles. The disorders designated "hysterical neuroses" constitute a small group of affections occurring chiefly in young and hysterical women, characterized by the occurrence of vesicular and bullous lesions, some taking on a gangrenous aspect, others exhibiting oddly arranged and defined streaks of dermatitis, to which latter the suspicion justly attaches that the lesions have been in great part produced by the patients themselves.

Sexual System.—The sexual system of both men and women, especially in young subjects, may be a source of cutaneous disorders. Among them may be named the seborrhœas, acnes, and comedones, often aggravated by menstruation and by perversion of function in both sexes, progeneral and menstrual herpes, pemphigus virginum, and certain of the erythemata. The several cutaneous affections recognized in the pregnant condition are often unquestionably associated with the condition of the gravid uterus. Of these, the most common are scarlatiniform erythema, impetigo herpetiformis, dermatitis herpetiformis, and verrucae of the vulvar region.

Auto-infection.—This is a field of investigation the confines of which have been barely touched by the explorations of modern science. At present it is demonstrable merely that the alimentary tract is traversed by innumerable micro-organisms which are wholly innocuous. Under certain favoring conditions, however, these germs may either be commingled with others introduced from without, and thus become in various degrees dangerous to the economy from slight perversion of health to actual destruction of life in a relatively brief period of time; or the innocuous parasites with and without the coöperation of the toxins they engender, may suddenly become inimical to health from a change in condition.

Ingesta.—Food and medicines are responsible for many cutaneous lesions in consequence, first, either of an inherent toxic quality in the substance ingested; or, secondly, in consequence of a special irritability of the alimentary canal existing at the time of such ingestion, the cause of the disorder being at other times ineffective.

Among the foods capable of producing urticarial distress may be named shell-fish, the smaller berries having seeds, cheese, pickles, oatmeal, buckwheat, mushrooms, olives, the skins and seeds of grapes and of oranges, and certain kinds of fish, as well as alcoholic beverages. A large list of medicinal substances which are capable of producing skin-eruptions is enumerated in the chapter on *Dermatitis Medicamentosa*. Among these may be named, as illustrative of the group, the salts of bromine and of iodine, arsenic, quinine, copaiba, belladonna, and a number of the new remedies produced by the action of glacial acetic acid upon the petroleum-products, such as antifebrin and phenacetine.

Physiological Crises.—These are not in themselves primary

causes of dermatoses, seeing that the larger number of all members of the human family survive them without harm to the skin. It is none the less true that they furnish influences which modify and at times invite exanthemata. The possibilities of the pregnant state in connection with cutaneous disease have already been explained. Dentition is a period in which the child often is tormented by an eczema displayed in greatest profusion over the cheeks; and the puberal epoch of both sexes is one in which are manifested many of the disorders related to the repression, perversion, or excessive indulgence of the sexual function. Many of the chloasmata are conspicuous in women at the time of the menopause; and this also is a period in which may be recognized irregularities in the performance of the sweat-function as well as in the subjective sensations experienced in the skin.

EXTERNAL CAUSES.

Innumerable agencies operate from without capable of exciting or aggravating cutaneous affections: in fact, few if any of the forces operating externally upon the skin from the beginning to the end of life may not exert an unfavorable effect upon it if their operation be excessive, untimely, or associated with other externally operating factors. Briefly, some of these agencies operate singly; others in coöperation; some operate with grave, others with trifling effect; some invariably, others but rarely, induce a deleterious effect upon the skin; some, though exerting an influence wholly external to the skin-surface, coöperate with internal agencies. In the latter class may be named the hand of the syphilitic subject, which may exhibit syphiloderma largely due to the influence of the articles handled in the trade or occupation of the subject of the disease.

Scratching.—Scratching is a fruitful source of cutaneous trouble either when operating to originate or to aggravate an exanthem. Its symptoms are carefully studied by all diagnosticians, as they betray evidences of itching, which the efforts at scratching are exerted to alleviate. The regions most affected when scratching is severe (as in prurigo, scabies, pediculosis, and the forms of pruritus dependent upon visceral disease, such as glycosuria, tuberculosis of the adrenals, etc.) are, as a rule, those most readily reached by the hands either of an infant or an adult. In these parts may then be recognized excoriations, frequently in two, three, or four parallel or approximated lines, blood-specks, pustules, papules, thickening, and even extreme induration and pigmentation of the skin, due solely to the traumatisms of the surface of the integument.

Solar Light, Heat, and Thermal Changes (whether due to solar or artificial influence, as well as cold), are frequent and efficient sources of damage to the skin from the slightest grade of inflammation to the severest destruction. To solar light is to be attributed the production of freckles, tan, and other pigmentations of the surface; to heat are to be attributed the erythema, the eczema, and the various

grades of dermatitis which may follow exposure to the direct rays of the sun. Other temperature-effects, including those produced by extremes of both heat and cold, are to be classed in the same category. Exposure of the skin to a temperature of over 100° F. produces merely a transient erythema, which under a further elevation of sixty-five degrees will not subside for several days. At a temperature of 212° F. all grades of acute dermatitis are awakened, with the production of bullæ, up to the point at which complete destruction of the integument occurs.

Seasons.—The influence of the seasons is of the same general character. Some cutaneous diseases are worse in summer; others in winter.¹ Prickly heat (*lichen tropicus*) is peculiar to certain warm seasons; frostbite, with its subsequent hyperæmia, exudation, or gangrene, occurs in winter; pruritus is common in cold weather; erythema multiforme is most frequent in the autumn and in the spring.

X-rays.—Exposure of the skin to the x-rays, not merely in securing skiagraphic results, but in the modern methods of treatment by radiotherapy, may produce slight or extremely grave changes in the skin and the structures beneath, including erythema, inflammation, telangiectases, atrophy, ulceration, and even carcinoma.

Climate.—Climate has a determining influence upon many cutaneous disorders, and this of a sort which it is difficult to assign either to internal or external influence. The effects of climate are exceedingly complex, and include the agencies which favorably or unfavorably affect the health in the direction of atmospheric humidity or dryness; abundance or scarcity of sunlight; the prevalence of favoring or injurious winds and storms; a salubrious or insalubrious food and water-supply; the average temperature of the earth's surface by day and by night; the presence or absence of sources of malarial plasmodia; and proximity to the sea, to mountain regions, or to extensive growths of pine forests. Thus leprosy, Lombardy erysipelas (*pellagra*), Biskra bouton, ainhum, and other affections, though not seen exclusively in one country, are for the most part prevalent in countries which may well be contrasted with others where such affections are regarded as curiosities. Mycetoma, for example, has been studied for the most part in India, while less than half a dozen cases of that disorder have been recognized in the North American continent.

Occupation.—Many dermatoses are due exclusively to the occupations of men and women. In France, where such occupations are highly specialized on account of the artistic and skilled work of the people in numerous lines, these disorders are known as the "professional dermatoses," and the diagnostician there is often enabled to decide the character of the work performed by the laborer on inspection of his hands. The workers in dyes, in chemicals, and in drugs suffer in one way; the men who handle tiles, bricks, mortar, or clay in

¹ Cf. Hyde, "On Affections of the Skin Induced by Temperature Variations in Cold Weather," *Chicago Med. Jour. and Exam.*, 1885, l., p. 187, and 1886, lii., p. 116; Corlett, *Jour. Cutan. Dis.*, 1894, xii., p. 457, and *Jour. Amer. Med. Assoc.*, 1902, xxxix., p. 1583.

another; the baker, the confectioner, the cook, the laundress, the green-grocer, the seamstress, the shoemaker, the carpenter, and the machinist have each their forms of erythema, dermatitis, keratosis, or induration. Similarly those whose faces are much exposed, as the wheelmen of vessels, tramcar-drivers, locomotive-engineers, and day-laborers, exhibit symptoms in that region. Butchers, wool-workers, cattle-men, and sheep-shearers are liable to contract glanders, ring-worm, or malignant pustule. They who handle the bodies of the dead are prone to tuberculosis of the hands (anatomical tubercle), and those compelled to stand much of the time are exposed to the consequences of varicose veins of the legs and resulting eczema of that region.

Clothing.—The coarse clothing worn by the poorer classes is often a source of skin-mischief, particularly when employed for infants; and persons of both sexes and all ages exhibit marked results from the wearing of flannel next the skin. Often the influence of clothing is commingled with that of dyes, as when brightly tinted flannel colored with anilin produces a dermatitis of high grade with distinct staining of the skin over which such clothing has been worn. In the same list must be included the effects produced by ill-fitting shoes, corsets, trusses, napkins, "pads," supporters, crutches, orthopædic apparatus, hat-bands, stockings, garters, and chest-protectors. Here, too, more than one cause may be efficient in the production of disease, as when clothing becomes a nidus for parasites, or is worn next the skin when soiled with abnormal or even physiological secretions.

Irritation.—Chemical, medicinal, and mechanical irritation may be responsible for many affections of the integument. Of articles effective in the first category, may be named the stronger acids and alkalis; of those in the second class, arnica, croton-oil, mustard, cowhage; of those in the last class may be suggested all substances capable of exerting undue friction upon the surface, such as pumice-stone, combs, brushes, towels, and the articles employed in the operations of the manicure.

Filth.—Filth is a potent factor in both the production and the aggravation of skin-disease, its effects being decidedly most apparent in patients applying to the public dispensaries. In infants the skin unwashed even for a fortnight usually becomes the seat of an irritating urticaria.

Traumatism.—Traumatism plays a most important part in cutaneous etiology. It includes the action in scratching, with the nails, of the knees, heels, elbows, etc., as well as the influence of articles used for the same purpose—pieces of cloth of various kinds, etc. In this way excoriations and even infiltrations, of the skin are induced. Under the head of traumatisms should be considered also injuries of the skin-surface produced by animals, occasionally with the added effect of a toxicant. Here are included the wounds produced by lice, fleas, bugs, and acari; the bites of serpents, horses, dogs, and cats; and the accidents producing traumatism of every kind, not

omitting the intentional wounds inflicted by the surgeon and their results.

Transmission by Contagion, by Infection, and by Parasites.—

Some disorders with cutaneous phenomena are transmissible from diseased to healthy persons through the medium of the atmosphere, and are termed *contagious*; others are termed *infectious* when transmissible solely by contact. Some maladies, such as variola, scarlatina, and measles, are conveyed by both methods, and hence belong to the category of both contagious and infectious disorders. Yet others are transmissible only through infection with a specific virus; such diseases are syphilis and lepra. By many writers the terms infectious and contagious are used as synonyms.

Many disorders are transmitted by the medium of insects (particularly the fly, the bed-bug, the louse, the flea, and the mosquito), which attack the skin and deposit in the solutions of continuity which they produce, bacteria or other noxious germs derived from foreign bodies on which they previously have alighted.

Parasitic Diseases.—Under this title were once included solely the dermatoses induced by the presence of the animal and vegetable parasites. Among the former may be named scabies and pediculosis; among the latter, ringworm of the scalp and of the beard. But the term parasite has acquired a much wider scope since the recognition of the micro-organisms which have been demonstrated to be efficient in the production of a long list of cutaneous affections. Among these may be named the bacilli productive of cutaneous tuberculosis and of lepra; the pus-cocci, responsible for the several forms of impetigo and pustular eczema; and the streptococci, recognized in several forms of dermatitis. In most of the dermatoses which are recorded to-day as parasitic, germs have been recognized, which either singly or in co-operation with others have been proved to be effective in the production of these disorders, or have been demonstrated to play an active part in either their extension or exacerbation.

The popular ideas respecting the frequency and danger of contagion in diseases of the skin are often erroneous. The non-parasitic affections are, and probably always will be, more numerous than all others. The danger of communicating scabies, syphilis, and other affections by handshaking is not as great as is generally believed. On the other hand, the dangers which by the mass of people are little considered are often the graver and more to be avoided. Among these may be named the use in public of the roller-towel, the drinking in common from public cups and glasses, promiscuous kissing, contact with the lower animals exhibiting diseases of the hide, of fur, or of feathers, the wearing of a stocking on one foot which the day before was worn over the surface of a fellow-member the seat of disease, and the wearing of velvet- or fur-trimmed collars on top-coats after the occurrence of a disease of the skin of that part of the neck with which the garment is naturally brought into contact.

IV. GENERAL PATHOLOGY.¹

THE pathological processes occurring in the skin are similar in many diseases to those occurring in other organs; but owing to complicated structure and functions the integument has a pathology peculiar to itself. Various pathological conditions, such as inflammation, hyperæmia, anæmia, hypertrophy, atrophy, degeneration, and neoplasms, are found in the skin, as in other organs of the body. Some diseases, such as the toxic erythemas, are merely cutaneous manifestations of an internal disorder which often exhibits no demonstrable internal lesions; in others, such as lupus vulgaris, the pathological and clinical manifestations are for the most part limited to the skin. Again, in diseases such as syphilis similar pathological changes may be noted both in the internal organs and in the skin.

Bacteria.—The skin furnishes a habitat for a large number of bacteria, both pathogenic and non-pathogenic. From the normal skin may be collected a number of varieties of cocci, bacilli, and yeasts. Many diseases of the skin are demonstrably of bacterial origin, while others are probably due to specific micro-organisms not yet recognized. Schizomycetes (tuberculosis, leprosy), streptotricheæ (actinomycosis), blastomycetes (blastomycosis cutanea), hyphomycetes (favus, "ringworm"), are all concerned in the production of diseases in the skin or its appendages. Animal parasites are responsible for several disorders (scabies, pediculosis).

Hyperæmia.—Hyperæmia in the skin may be active or passive, local or general, transient or persistent. On account of the conditions which may be associated with hyperæmia it plays an important part both in cutaneous and general pathology. Galloway has emphasized the importance of erythema as an indicator of disease.²

Anæmia.—Anæmia may be general or local. It is not a frequent factor in the production of cutaneous disease. Generalized anæmia is a symptom of several diseases of the blood. Local anæmia occurs in Raynaud's disease. Local, transient anæmia occurs in urticaria and when cold is applied to the integument.

Inflammation.—Some of the many phases and pathological changes of the process recognized as inflammation are present in the majority of cutaneous diseases. Primarily, there occurs vascular dilatation, with leukocytic infiltration and exudation of plasma. The leukocytes, attracted by positive chemotaxis to the point of irritation,

¹ For a complete presentation of the subject of the pathology of the skin, see Unna, *Histopathology*; Darier, *La Pratique Dermatologique*, pp. 67-136; MacLeod, *Pathology of the Skin*.

² *Brit. Jour. Derm.*, 1903, xv., p. 235.

either remove the offending material, micro-organisms, etc., by phagocytic action, or themselves are overcome, undergo fatty degeneration, and become converted into pus-cells. The chemotactic agent may be a mechanical, chemical, or thermic irritant, or its cellular products. The toxins of micro-organisms may be effective. The plasma dilutes the toxins, and by depositing fibrin through the action of a ferment helps limit the process. Varying with the degree of the reaction and its attendant conditions, numerous secondary epidermal changes occur.

Histology.—The epidermis and corium, being unlike in development and structure, undergo different pathological changes.

The epidermis is composed of epithelial cells in various stages of evolution, from the columnar, nucleated, and comparatively highly differentiated cell of the basal layer of the rete mucosum, to the flat and lifeless external cells of the stratum corneum. A knowledge of the normal process of evolution of these cells is necessary to an understanding of the changes which necessarily must occur in morbid conditions when the normal course of evolution is interrupted by some mechanical, chemical, microbic, or other agency. Each cell progresses from the basal layer of the rete through the several strata above until it reaches the superficial part of the stratum corneum, having on its way passed through various stages, and performed different functions. After completing its cycle of existence it is finally cast off.

In the basal layer are situated the mother-cells of the epidermis. They are columnar in shape, contain nuclei and pigment, receive the termination of non-medullated nerve-fibrils, and have extending from them prolongations of protoplasm called prickles. As they progress upward through the rete they become gradually flattened, no longer contain pigment (in the white races), and on reaching the granular layer are filled with granules of keratohyalin, upon the perfect formation of which depends the normal process of cornification. Further up, the cells become homogeneous and lose their keratohyalin, but acquire eleidin in the stratum lucidum. In the lower part of the stratum corneum their nuclei disappear and a horny substance, termed keratin, is formed, to which substance this layer owes its hardness. Here also some fat appears. Still more externally, the cells become entirely flat and lifeless, and eventually are shed.

Hyperkeratosis—Acanthosis.—One or all of the layers of the epidermis may be involved in pathological processes depending upon the character of the change and its cause. When there is overgrowth (hypertrophy), either local or generalized, of the stratum corneum, it is designated as a hyperkeratosis, examples of which are seen in keratoderma and ichthyosis.

By acanthosis (Unna) is meant a benign hypertrophy of the rete, in which the fibrillary structure of the cell is retained. Acanthosis occurs in all the infective granulomata, including syphilis and tuberculosis. Malignant hypertrophy of the rete occurs in epithelioma, in which affection the normal rete-pegs not only are enlarged and elongated (acanthosis), but there are also rupture of the basal layer and

irregular infiltration into the corium, of epithelial cells, which lose their fibrillary structure and often become so changed as to resemble cells of mesoblastic origin.

Atrophy.—Atrophy of the cells of the epidermis occurs under various conditions. It may be caused by pressure, either external, as from a truss; or internal (neoplasm beneath the skin). It is found commonly in the senile skin, and is marked in cases of diffuse idiopathic atrophy of the skin.

Parakeratosis, Production of Vesicles, Bullæ, and Pustules.—Œdema occurring in and between the rete-cells interferes with the formation of keratohyalin in the granular layer, causes the cells of the stratum corneum to appear swollen and moist and to retain their nuclei, and prevents the formation of keratin. This condition is termed "parakeratosis" (Unna), and is found in typical development in eczema and psoriasis. When the œdema becomes greater, collections of fluid form usually in the rete, and thus vesicles are produced. They are called "parenchymatous" when the early œdema is intracellular, or "interstitial" if it be intercellular. Vesicles may be located superficially in the rete, as they usually are in eczema; or deeper, as in dermatitis herpetiformis; or beneath the epidermis, as occasionally happens in herpes zoster. Vesicle-formation is dependent not only on the mechanical separation of the cells by œdema, but also upon the presence of toxic and other substances in the lymph, which may produce separation and disintegration of the epithelial cells, and thus leave spaces. Bullæ similarly are formed and located, and differ from vesicles chiefly in being larger. A typical bullous disease is pemphigus. When a large number of leukocytes collected in a chamber by chemotactic or other action, have undergone fatty degeneration, the lesion becomes a pustule. When œdema is long persistent, such as occurs when the leg is the seat of varicose veins, the epidermis is destroyed entirely and ulceration results.

Epithelial Degeneration.—The cells of the epidermis are subject to degenerative processes, the one most studied being of the "hyaline" type. This occurs in carcinoma and also in several other diseases, but is not, as once was believed, pathognomonic (see cellular degenerations of the corium). Degeneration occurring in epithelial cells exposed to x-rays, though not definitely classified, is pronounced and important. The nucleus as well as the cellular protoplasm is affected. The cell is swollen, stains poorly, becomes vacuolated, and eventually completely disintegrates and is carried away by leucocytic action during the period of reaction.¹

Fibrous and Cellular Structure of the Corium.—The corium is mesoblastic in origin, and is composed of fibrous tissue and cellular elements. The white fibrous bundles are termed collagen, while the yellow elastic fibres are termed elastin. The cells found normally

¹ Scholtz, *Archiv*, 1902, lix., pp. 87 and 241 (abstr. in *Brit. Jour. Derm.*, 1902, xiv., p. 397).

in the corium are connective-tissue, mast-, and vacuolated cells. As cellular pathology is so important in cutaneous disease, some knowledge of the minute structure of normal and pathological cells is essential.

The common types of connective-tissue cell are large, spindle-shaped cells, which vary both as to size and shape. They have extending processes, which connect with those of neighboring cells. The nucleus is surrounded by a membrane, is usually either oval or round in shape, and is said to be *vesicular* on account of its open appearance, which is due to large spaces found between the chromatin threads. This open structure causes it to stain less deeply than the more compact nucleus of the mononuclear leukocyte, with which it often is confounded. In young connective tissue the cells are small and more or less oval, have a nucleus as above described, are surrounded by cell-protoplasm, and are termed *fibroblasts*. Other and less common varieties of connective-tissue cells are described by Unna as *plate-cells*.

Vacuolated cells of the corium have nuclei similar to those of ordinary connective-tissue cells. The cell-protoplasm presents spaces or vacuoles, but has no processes extending from it. On account of mitoses occurring in these cells, and because their apparent function is that of reproduction and not of evolution into connective tissue, MacLeod suggests that these may be the mother-cells of the corium, being thus analogous to the cells of the basal layer of the epidermis.

Mast-cells in the corium resemble other connective-tissue cells, but differ from them in that they contain a number of basophilic granules. They are discussed more fully in connection with the pathological cells of the corium.

Pathological Cells of the Corium.—Plasma-cells.—Before Unna described the cell now generally recognized as the plasma-cell, at least two classes of cells were so denominated. The term is now restricted to cells which vary in size from that of a leukocyte to that of a cell two or three times as large. They are rounded or oval in shape and contain a large amount of protoplasm. The nucleus is usually eccentrically placed and corresponds in shape to that of the cell. It may be vesicular in appearance, or again several deeply stained masses of chromatin may be arranged about its border. Two nuclei are occasionally present. A cell having a similar nucleus, but containing a small amount of protoplasm, is found abundantly in tuberculosis, but is considered by many to be a lymphocyte. Plasma-cells are found abundantly in the infective granulomata, and to these cellular infiltrations Unna applied the term *granuloma*. Unna maintains that plasma-cells originate from connective-tissue cells, while Jadassohn, Councilman, Krompecher, Schottlander-Vmarschalko, and others believe that they arise from leukocytes. Krompecher, Vmarschalko, and others agree that these cells evolve into connective tissue, thus admitting the formation of connective tissue from leukocytes.¹ Plasma-

¹ For full consideration of the cells of chronic inflammation, including plasma-cells and mast-cells, the reader is referred to a critical review of the literature by

cells are studied best when stained with polychrome-methylene-blue (Unna), or Pappenheim's compound stain of pyronin-methyl-green. In the former, metachromatism is shown by the nucleus taking a blue color, while the protoplasm is stained a blue violet.

Giant-cells occur in typical development in tuberculosis, but are found to a degree in syphilis, and cells resembling them may be noted in several chronic inflammatory diseases of the skin. The tubercular giant-cell may be round, oval, or irregular in shape, depending somewhat on its surroundings, as, for example, the presence of collagen, elastin, etc. They vary in size from two or three to many times the dimensions of a leukocyte. They contain nuclei which are similar to those of plasma-cells; and which may be arranged at one or both ends or sides, or completely round the periphery of the cell, and may number from a dozen or less to more than a hundred in a single cell. They stain deeply, thus making a contrast with the poorly stained centre of the cell, which presents a homogeneous protoplasm. As to their origin, several theories are advanced. One is that they are formed by the rapid proliferation of the nuclei in a single cell without corresponding division of the protoplasm. A second is that a number of cells surround some irritant, such as tubercle-bacilli, and coalesce, thus producing the multinucleated giant-cell. The question whether the giant-cell originally comes from connective-tissue cells or from leukocytes cannot be answered until the origin of the plasma-cell has been determined.

Mast-cells occur to some extent in the normal corium, and are found in increased numbers in some diseases, including the infective granulomata, in which they are not specially significant. In urticaria pigmentosa, however, their increase is so marked as to be pathognomonic. They may be produced rapidly, as was demonstrated by Gilchrist,¹ who noted that they formed synchronously with an urticarial wheal. They may assume the shape of a connective-tissue cell, plasma-cell, or lymphocyte, and may originate apparently from any cell found in the corium. Their chief characteristic is the presence of basophilic granules in the protoplasm. Mast-cells of the corium correspond in staining reactions to Ehrlich's mast-cells of the blood, but it does not follow that those present in the cutis come from the blood. They are demonstrated best by stains having metachromatic properties, such as polychrome-methylene-blue (Unna), which stains the nucleus blue and the granules red.

Degenerations Occurring in the Corium.—Hyaline degeneration similar to that occurring in epithelial cells in carcinoma is found also in the corium in sarcoma, in rhinoscleroma, in syphilis, and in other affections. It produces a homogeneous material in the cellular protoplasm, which is acidophilic in reaction and, owing to its semifluid

Williams, Amer. Jour. Med. Sci., 1900, exix., p. 702; a series of papers by Pappenheim, and by Almkvist, Monatshefte, 1901-2; Maximow's monograph, Ziegler's Beitrage, Suppl. v., 1902; and a review of the subject by Whitfield, Brit. Jour. Derm., 1904, xvi., pp. 7 and 63.

¹ Johns Hopkins Hosp. Bull., 1896, vii., p. 140.

character, forms round globules. Hyalin is stained orange-red by Van Gieson's method.

Fatty Degeneration occurs in several conditions in the skin, and is well represented in xanthoma. Here are found variously sized granules within a large cell, known as the xanthoma-cell, which is characteristic histologically of the disease. This cell is the product of a connective-tissue cell in the multiplex varieties, while, according to Pollitzer,¹ in eyelid xanthoma it results from degeneration of muscular tissue.

Mucoid Degeneration is found in the "Mikulicz cells" of rhinoscleroma and in the lepra-cell of lepra. In both it occurs as a homogeneous mass, within which the specific bacilli are found.

Œdematous Degeneration occurs in the cells of the corium, which is the seat of marked œdema. They appear swollen, stain poorly, and contain fluid. This form of degeneration is seen in tissue reacting after exposure to actinic and Röntgen rays.

Crenation-degeneration is found in mycosis fungoides, and is evidenced by the cell becoming irregular and toothed. Eventually the cell entirely disintegrates.

In addition to the cellular degenerations described above, several degenerative processes occur which affect the collagen and elastin.

Myxomatous Degeneration, in which a peculiar jelly-like substance containing mucin results from collagenous degeneration, is found in sarcoma and myxœdema. This substance is basophilic in reaction and is stained by any of the metachromatic dyes.

Colloid Degeneration in the skin is comparatively rare. It occurs in the disease termed colloid milium. It consists of a homogeneous degeneration of the fibrous elements of the corium. The exact chemical composition of the colloid material is not known. It is stained yellowish-red by Van Gieson's method.

Other degenerations occur in the corium, in which collagen and elastin are concerned, and these are demonstrated chiefly by the staining methods described by Unna,² and are termed basophilic collagen, collastin, collacin, and elascin.

¹ Jour. Cutan. Dis., 1897, xv., p. 367; N. Y. Med. Jour., 1897, lxx., p. 679.

² Monatshefte, 1894, xix., p. 465.

V. GENERAL DIAGNOSIS.

THE establishment of an accurate diagnosis in cutaneous diseases is essential to their successful management. This statement is rendered necessary in this connection by the prevalence of a belief among the uneducated that the disorders of the skin, exhibited for the most part in visible symptoms, can safely be treated on general principles without a recognition of the nature of the malady. By many practitioners the demand for an accurate diagnosis is ignored in consequence of a too general impression that the desired end is to be pursued through great and perplexing obscurity. Yet with patience, method, a habit of careful observation (without which no physician is successful), and a reasonable degree of skill both practitioner and student can, in the large proportion of all cases, attain their purpose.

It is a popular error that the sole requisite for establishing a diagnosis is the exhibition of an affected portion of the integument to the eye of him who is consulted with a view to its relief. The physician is supposed to inspect this surface attentively for a few moments, and then to pronounce definitely upon the nature of the disease present and the therapeutic measures to be adopted. While such a procedure is possible to the expert in a limited number of cutaneous disorders, in a large number of cases far more than this is requisite, and, indeed, is fully as essential here as in the investigation of disease involving any other organ of the body.

It is true that erythema, urticaria, dermatitis, eczema, purpura, alopecia, and many other affections of the skin may often be recognized after simple and brief inspection of the region involved; but the cause of such disorders and their relation to the general health of the patient, all of which knowledge is essential to their proper treatment, can only be obtained after a much more thorough examination. As a rule, it is desirable, first, to secure a history of the physical and mental condition of the patient in the past; then should follow the special history of the disorders of the skin; lastly, an examination of the patient and of the affected integument. The family history may be of value in making a diagnosis. For the purpose of methodically arriving at these facts, and of preserving them for future reference, they should systematically be recorded. The following are some of the points upon which it will generally be found useful to secure information:

The name, residence, age, sex, occupation, and married or unmarried state of the patient should be known, as also, whenever practicable, the health-history of parents and children. In the case of

women it is not only necessary to learn the history of the menstrual function in the past, but it is of the highest importance to be informed also as to the previous occurrence of abortions and miscarriages, and, if such have occurred, the order observed by these with relation to the birth of viable infants. The significance and value of several of these facts have been described in the chapter on Etiology. The history of the products of conception has a most important bearing upon the question of syphilitic infection. The absolute exclusion of syphilis in any obscure case is a long step in the direction of an accurate diagnosis. In the instance of male patients, questions will usually elicit either admission or denial of the fact of a precedent or present venereal disease, and the answers should be regarded as valueless or trustworthy according as they are or are not substantiated by corroborative clinical facts.

Then should follow some record of the habits of the patient, as to active or sedentary employment, bathing, food, and drink, including under the latter term the use of beer, wine, and spirits. The history of any previous disorders, whether of the skin or other organs, should be satisfactorily clear, and the dates of occurrence, recurrence, and convalescence be at least approximately discovered. The patient should also make known whether he has had refreshing sleep; whether he has undergone mental anxieties (domestic, financial, etc.); whether he has suffered in his digestive, respiratory, circulatory, genito-urinary, or nervous system. Defects in elimination, assimilation, and nutrition should be noted; and when the symptoms suggest disease of other organs than the skin the patient should be subjected to the proper physical examination.

This much ascertained, the patient should be encouraged to narrate as succinctly as possible, and as far as may be in his own terms, the history of the present cutaneous disorder. A systematic series of questions put by the examiner should disclose, if possible: the cause of the disorder; its appearance when first seen, and any changes in character and type which have since occurred; the regions of the body affected, in order of involvement; the method of extension, by peripheral enlargement of the early areas, or by the appearance of new lesions at a distance from those first observed; the rapidity and regularity of the progress of the disease and its duration; the subjective sensations; and the influence of seasons and temperature upon the disorder. The treatment to which the disease has been subjected should then be detailed, this frequently furnishing a key to the diagnosis and therapy of the malady. In a large proportion of all cases, ignorantly directed and vicious internal or external medication has either begotten or aggravated the disease of the skin. This much ascertained, the physician is ready to examine the affected surface for himself.

During, however, the verbal interrogations which are required for this part of the exploration of the case, the watchful and observant practitioner will probably have secured for himself some useful infor-

mation of which the patient is totally unconscious. Much of this is difficult to describe, as it is the rich fruit of wide experience and careful scrutiny. With a gentle, courteous, and sympathizing manner the diagnostician must combine the art of a detective and the skill of a swordsman. Glancing occasionally at the face of his patient while making record of the answers given, he will, of course, have observed any eruption upon that portion of the body. He will have made a mental note of the temperament of the sufferer, and of any movement made by the latter indicating a tendency to scratch or rub portions of the skin. He will have noticed the posture, clothing, and head-apparel; the existence of hair on the scalp or extensive baldness; the condition of the exposed hands as indicating manual labor or the reverse; and, in the absence of facial lesions, will have observed the special tint of the skin of the face, as suggesting anæmia, chlorosis, or a general condition of cachexia. The facial expression, as indicative of anxiety or placidity, habits of debauch, sexual excesses, etc., will not have escaped his attention. All this and much more will possibly have enabled the questioner to direct his interrogatories into the channel in which they will elicit the most useful responses. The posture, cries, facial expression, and general condition of nutrition of the infant will have been no less carefully noted.

Proceeding to the examination of the affected integument, the physician must assure himself of a good light, as colors are best distinguished by daylight and artificial illumination should be reserved for exploration of the cavities of the body. The air of the apartment should be sufficiently warm to permit of exposure of the person without discomfort and without causing disturbance of the cutaneous circulation. Adult males and children of both sexes should have the clothing completely removed so that all portions of the skin may be inspected. One portion of the body may, however, be examined, and then covered if desired, while the examiner proceeds to direct his attention to another part. In the case of women the investigation should be conducted with the tact and delicacy to which the sex is entitled.

The examination, whenever practicable, should extend over the entire surface of the integument. The importance of this point can scarcely be exaggerated. It must be remembered that the physician should be much wiser than his patient, and the assurances of the latter are always to be accepted with reserve. Thus, one who merely exposes his leg, stating that this is the only part of his body affected, may have concealed beneath his clothing extensive varicosities of the veins of the thigh, a typical syphilitic exanthem over the belly, a significant scar on the elbow, an extensive patch of tinea versicolor on the surface of the chest, or a blennorrhagic discharge from the urethra, the medication of which has induced the rash for which he seeks relief. These are not the rare, but are the common cases of a daily experience.

Observation should be had at this time of the general and special

features of the eruption. As to the former, the following considerations should be borne in mind:

The original manifestations of a cutaneous disease may be masked or entirely hidden by the lesions resulting from scratching, or by a dermatitis due to local applications, or to drugs swallowed for the relief of the original disorder. It is of the greatest importance that the accidental nature of these symptoms be recognized, as they otherwise lead to great confusion in diagnosis.

Rarely a disease involves the entire surface of the body, leaving no part unaffected, and then is said to be universal in distribution; more frequently an eruption affects at one time several or most of the regions of the body-surface, and then is called generalized; much more commonly an eruption affects a considerable portion of but one or several regions, and is said to be diffuse; or it is limited to small areas of one or several definite regions, and is known as a local eruption.

A symmetrical eruption, one equally distributed over corresponding regions of both sides of the body, is rarely the result of an etiological factor operating upon the outer skin. It more often points to an efficient cause of internal origin. An eruption affecting the covered integument, never creeping out upon the exposed surfaces, suggests the operation of the clothing, as the latter may chance to prove the nidus or protector of a parasite, the fabric which has been colored by a noxious dye, the recipient of a chemically altered secretion which has proved irritating to the surface, the instrument of friction, or the source of increased temperature at the surface by its non-conductivity of heat and unseasonable thickness. An eruption accompanied by excoriations and scratch-lines is usually severest in the parts most accessible to the hands, and least developed where the latter have the least play, as over some parts of the back. An eruption limited to the hands is likely to be one induced by an agent to which the hands alone have been exposed. Such are the eruptions originating in the trades and domestic occupations; in the latter, an eruption more distinct on the right hand, and especially about the right thumb and index finger, tells its own story when the hand-worker is not ambidextrous nor left-handed. Artificially and intentionally produced eruptions, as in malingering, hysteria, mental depravity, and insanity, usually occur also in parts to which the right hand finds easy access.

Eruptions occurring on the face, the hands, and the genitalia of men, or on the face, hands, and mammæ of women, point to external contact or contagion (poison-ivy, scabies, croton-oil, etc.), since, next to the face, the hands are more commonly brought in contact with the parts named in the sexes respectively, as the wearing-apparel of each suggests.

An eruption limited to the forehead suggests an inspection of the hat-band, the veil, or the overlying false hair; to the ears of women, a glimpse at possibly cheap ear-rings; to the centre of the root of the

neck, before or behind, a scrutiny of the collar-button and collar; to the anus of the baby, an inquiry as to the changing of its napkins; to the wrists of the adult, a question as to the cuffs worn; to the feet, information respecting gaiters, varicose veins, recently cut corns, and ill-fitting boots. Eruptions springing from each of these causes have been treated long and vainly as "diseases of the blood."

Eruptions markedly asymmetrical are indicative of asymmetrically operating causes—that is, the accidents of environment, or else influences exerted within the body unequally on its two lateral halves. Thus, an orthopædic apparatus worn to correct talipes excites a dermatitis of the leg of the affected side only; and zoster of the trunk is evident on that side supplied by the intercostal nerve which has been inflamed. The greater stress may be laid on this peculiarity, as the law of symmetry, in eruptions not occasioned by causes operating on the outer skin, is faithfully observed in nature. The earlier syphilides, the quinine-exanthem, rubeola, and even lupus erythematosus, are remarkable illustrations of this fact.

Proceeding with the visible characteristics of the disorder, the physician will not fail to note an acuteness or chronicity of the eruption; also, the presence or absence of an exudate on the surface.

After obtaining an impression of the general features of an eruption the individual lesions should be carefully studied. The type of lesion (papule, tubercle, vesicle, etc.) should be noted. When the lesions are multiform the different types should be examined to determine, if possible, which are primary and which consecutive in appearance, which are essential and which accidental in the process. For the purpose of studying the characteristics of the individual lesions, those of most recent appearance (usually at the border of a patch), and as yet unmodified by scratching, treatment, and other influences, should be selected. Often, however, the full evolution of a lesion requires time, and its successive stages should be determined by observing a number of lesions of different ages.

The arrangement of lesions varies greatly in different diseases. When grouped such lesions may develop in circular, oval, angular, or irregular-shaped areas; or in circinate, gyrate, serpiginous, straight, or irregular bands and lines. In some affections (as ringworm, psoriasis, syphilis) the areas may become clear in the centre as the border progresses. Lesions may be grouped, and yet discrete in that each lesion preserves its outline and identity; or they may coalesce so completely that all trace of the form of the individual lesion is lost.

The definition of lesions is another important diagnostic feature in which cutaneous affections vary greatly: the line dividing the diseased from the normal skin may be so sharp and fine that it can be traced with the point of a pin; or the lesion may shade so gradually into the normal skin that its outline cannot be definitely determined, and it is said to have poor definition or none.

The color of lesions of the skin often depends greatly upon circumstances having no bearing upon the disease in question. It thus varies

with the natural color (light or dark) of the individual's skin, with the temperature of the surface, and with the amount of irritation to which the surface has been subjected by friction with rough clothing, scratching, treatment, etc. There are, however, some diseases (syphilis, lichen planus, tinea versicolor, favus, and others) in which the color may be of great importance in the diagnosis, and there are many maladies in which consideration of this characteristic of the eruption is of value if the accidental modifications be borne in mind. The acuteness or chronicity of a disease is often indicated by the color of the lesions. The persistence, modification, or disappearance of color under pressure should be noted. For this purpose a small glass disc or glass tongue-depressor is better than the finger.

In judging of the size of a lesion it is sometimes important to learn, by palpation, how much of it is above the general surface of the skin and how much is more deeply situated. In noting the shape of papules, tubercles, vesicles, and pustules, both apex and base should be taken into consideration. Thus, the apex may be pointed (acuminate), rounded (obtuse), flat (plane), or depressed (umbilicated). The base may be round, oval, angular, polygonal, or irregular.

The situation of lesions in or about the hair-follicles or at the opening of the ducts of the sebaceous or coil-glands is a diagnostic point of great value. It is important to know if certain lesions appeared first upon normal skin, or if they originated in other lesions. Thus, vesicles and pustules may arise from sound surfaces, or from the apices of papules or tubercles. The majority of even the elementary lesions are probably preceded by macules, which, however, are often so transitory as to be unrecognized and unimportant.

The career of an individual lesion, which often bears no relation to the duration of the disease as a whole, should be noted. Thus, the vesicle of eczema rarely exists as such for more than a few hours, though by the formation of new vesicles eczema may persist for months, while in zoster, individual vesicles last several days, though the disease as a whole is short-lived. In some diseases the type of lesion remains the same throughout its career unless modified by treatment or external influences, while in others the type changes or is complicated by other types. Thus, the papule may be modified by developing at its apex a vesicle or pustule. The career of lesions can usually be studied, not only by watching them from day to day, but also—and more easily—by observing at one time a number of lesions in various stages of development.

As the lesions of different affections vary greatly in their evolution and career, so do they in their evolution. While in the majority of instances it is the recent and newly formed lesion that is most useful for purposes of study, there is often much to be learned from the manner in which lesions disappear and in the traces they leave. The papule or tubercle which ulcerates usually suggests (aside from some rare disease) syphilis, tuberculosis, or carcinoma, and may be sufficient to exclude from the diagnosis the possibility of

psoriasis, seborrhœa, and other superficial affections. In a doubtful case the termination of some of the lesions in scar-tissue may be the one fact needed to make a differential diagnosis between seborrhœa and lupus erythematosus, or between a circinate form of psoriasis and a similar type of syphilitic eruption. Pigmentation sufficiently characteristic for a diagnosis is left after the otherwise complete involution of some lesions. This is most frequently true in zoster, lichen planus, and some forms of syphilitic eruptions. In estimating the time of involution of lesions and in making a prognosis regarding the disappearance of pigmentation (a point upon which patients are often solicitous) it should be remembered that pigment is usually removed very slowly from the lower extremities and other dependent portions of the body, and that in such localities it may persist for months or years after it has disappeared from parts in which the return-circulation is better.

Certain lesions have special features that should be studied. These are given in detail in the last division of the outline at the close of this chapter.

Before concluding his examination the physician will rupture a bleb, pustule, or vesicle, should such be found, to discover the nature of its contents. He will remove one or several crusts in sight, to expose the surface on which they rest. He will scrape away a few scales with the dermal curette for a similar reason. He will pinch between thumb and finger a portion of each part, in order to determine its infiltrated condition, its atrophy, or its attachment to the tissues beneath. He will pass his hands over the surface to recognize the firmness or the softness of the lesions, their inflammatory, hyperplastic, or neoplastic character, their dryness or moisture, and the existence of sebaceous or of perspiratory secretion. He will look at the mouths of the follicles where such secretion is retained or is abundantly exuded. He will discover any lice or their ova between or upon the hairs, any ascarides at play about the anus, any morbid formation of the nail or deformity of its matrix. He will examine for inguinal, post-cervical, axillary, and epitrochlear adenopathy, and will thus be often greatly aided in his task. This done, he will question in turn for himself, and by the methods recognized in medical science, the organs of the body other than the skin. He will inspect the tongue carefully, and if then he considers himself through with the mouth he will be guilty of great error. The gums rarely deceive the questioning eye; the inside of the lips, the fauces, and the tonsils are all to be searched. A mucous patch here will often echo the story of a palmar or a plantar syphiloderm. The laryngoscope may be called for in syphilis, cancer, lupus, and leprosy. The degree of distention of the belly and the region of hepatic dulness should not be overlooked. The genitalia of men, and of children and infants, can usually be explored. For women unaffected with syphilis or disease limited to these parts an exception in this particular should usually be made.

In many cases the microscopical and bacteriological examination

of hairs, scales, crusts, exudate, or tissue is essential to the diagnosis.

With the necessary reserve of all very obscure cases, it may be said that the physician who has conscientiously conducted an examination after the manner described above, is in possession of the diagnosis for which he seeks. If the facts thus acquired have properly been recorded, and yet do not spell out such a diagnosis to his eyes, they will probably be legible to others with a wider experience or riper judgment, to whom such a record may be shown. It is not claimed that this exhaustive method of examination is requisite in every case, as, for example, in order to recognize favus or to differentiate erysipelas from erythema. But it is certain that few obscure cases of skin disease will remain such under severe scrutiny, and the establishment of a thorough and exhaustive method of examination is important in the earliest experience with disease. Let the student or the practitioner conduct such an examination in the first few cases of eruption upon the surface of the body for which his advice is sought, and he will establish a habit of observation in comparison with which his pecuniary or professional success in the management of the same cases will indeed be of trivial worth.

Upon one special point should the inexperienced physician be guarded. It relates to the acceptance of a diagnosis which is *not* based upon such an examination as that given in outline above. A diagnosis by a patient is usually faulty, and the verdict of even skilled practitioners may be founded upon an error. The careful diagnostician should begin his task in a spirit of skepticism, and pronounce definitely only upon ascertained facts. The man who says he has an "eczema" may be louse-bitten; the woman who has been "overheated" may prove syphilitic. The patient recognized as suffering from ringworm of the beard may not have been infected under the hands of a barber. Finally, the eruptions upon patients unmistakably syphilitic are often of other than syphilitic origin. These infected subjects—men, women, and children—are exposed daily to the accidents from which the non-infected suffer. They exhibit acne, physiological alopecia, and dermatitis medicamentosa equally with the non-syphilitic.

Tuberculin.—Three methods of administering tuberculin for purposes of diagnosis are now available: First, by giving hypodermatically Koch's old tuberculin, second, the "Von Pirquet" tuberculin test; and third, the ophthalmo-tuberculin test.

Hypodermic Test.—Koch's old tuberculin is given preferably at midnight beginning with one quarter of a milligram (.00025). The patient should have been prepared by being kept quiet for two days preceding the test and his temperature taken every two hours to determine the normal. If this be found to amount to 100 or more degrees the test should not be used. The reaction begins in from eight to twenty hours after the injection, usually in eighteen hours, and is indicated by a rise in temperature to 100, 101, or even

104 or 105 degrees. This is accompanied by severe headache, a feeling of general malaise, pain in the back and limbs, loss of appetite, at times nausea and vomiting, and if severe, by grave prostration. As a rule the symptoms subside in twenty-four hours, but may require two or three days to disappear. In addition to the general symptoms above recorded a local reaction is evident in the cutaneous lesion exhibited by redness and other inflammatory phenomena. If no reaction occurs a second dose of one milligram (.001) is given in three days. If still no reaction, a third dose of three milligrams (.003) is given in another three days. If after this no reaction is evident the diagnosis may be considered negative as to tuberculosis.

"Von Pirquet" Test.—This is practically a local vaccination method. Two solutions are necessary: First a 25 per cent. solution of Koch's old tuberculin; second, a blank solution. Dr. Lincoln¹ suggests for the first solution one part tuberculin, one part five per cent. carbolic acid in glycerin, and two parts sterile 0.85 per cent. salt solution. The blank solution represents one part five per cent. carbolic acid in glycerine and three parts sterile 0.85 per cent. salt solution.

The arm is cleansed as in ordinary vaccination and one drop of each of the above solutions is placed on the cleansed area about two inches apart. Each is then scarified into the skin, with care not to make the surface bleed. Each drop is allowed to dry and is protected by a shield. In twenty to twenty-four hours the reaction, if it occur, is at its maximum and is exhibited as a hyperæmic, sharply circumscribed, infiltrated lesion. There may be vesicle-formation followed by crusting. In the area treated by the blank solution no significant change should occur. The reaction subsides in one to three weeks and is unaccompanied by constitutional symptoms.

Ophthmo-tuberculin Test.—A one per cent. solution of tuberculin is used. This may be prepared by adding one tablet of prepared tuberculin (to be had in the market, prepared for this purpose) to one c.c. of sterile 0.85 per cent. salt solution.

The eyes should be free from all evidence of inflammatory changes when the test is made. If found normal, one drop of the solution named is instilled into one eye. The liquid should be moderately warm and then diffused over the conjunctiva by gentle manipulation of the lower lid. The reaction reaches its maximum in twenty-four to thirty-six hours and subsides in two days to one week as a rule, and is exhibited as a catarrhal conjunctivitis. Usually no subjective sensations are present, though mild burning and smarting with photophobia may occur.

A positive reaction is indicative of tuberculosis in some region of the body provided the eye has not been previously tested. It is important to note that tests repeated after five to eight days are valueless.

The following outline for the methodical examination of a patient

¹ Lincoln, May C., *Journ. Amer. Med. Assoc.*, 1908; vol. li., 21, 1756-1761.

affected with skin disease is based on the subjects considered in the preceding pages, and is given in such detail that a careful investigation of the questions suggested should furnish material for all but exceptional cases. For the average case much may be omitted.

The first attempts to follow such a scheme are necessarily tedious, and therefore often discouraging; but one patient thus carefully examined is of greater educational value than an aimless and indefinite examination of a dozen cases. There is no greater economy of time than is found in methodical and systematic habits of work.

HISTORY.

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| <ul style="list-style-type: none"> I. NAME AND RESIDENCE. II. AGE. III. SEX. IV. MARRIED OR UNMARRIED. <ul style="list-style-type: none"> 1. Children. <ul style="list-style-type: none"> a. Living. b. Dead. 2. Abortions or Miscarriages. V. FAMILY HISTORY. VI. INDIVIDUAL HISTORY, <i>including that of previous skin diseases.</i> VII. OCCUPATION. VIII. HABITS, <i>of eating, drinking, bathing, tobacco-usage, etc.</i> IX. PRESENT STATE OF HEALTH.
(<i>Note the condition of the digestive, respiratory, circulatory, genito-urinary, and nervous</i> | <ul style="list-style-type: none"> <i>systems; also, defects in assimilation, elimination, and nutrition.)</i> X. HISTORY OF PRESENT SKIN DISEASES. <ul style="list-style-type: none"> 1. Cause—if known. 2. Character at first. 3. Sites affected in order. 4. Manner of progressing. <ul style="list-style-type: none"> a. Slow or rapid. b. Steady or irregular. c. With exacerbations and remissions. d. With periods of entire freedom from symptoms. 5. Changes in character. 6. Subjective sensations. 7. Duration. 8. Effect of temperature and seasons. 9. Treatment to date. |
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OBJECTIVE SYMPTOMS.

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| <ul style="list-style-type: none"> A. ACCIDENTAL COMPLICATIONS <i>due to scratching, treatment, etc.</i> B. SITE. <ul style="list-style-type: none"> 1. Universal. 2. Generalized. 3. Diffuse. 4. Local. (<i>Note influence of clothing, occupation, etc.</i>) I. Uniformity, <i>or multiformity.</i> II. Arrangement. <ul style="list-style-type: none"> 1. Isolated. 2. Grouped. (<i>Circinate, linear, etc.</i>). 3. Discrete. 4. Coalescing. 5. Irregular. III. Definition. (<i>Sharp, fair, poor, or none.</i>) IV. Elevation, <i>or depression.</i> V. Color. <ul style="list-style-type: none"> 1. Persistent. 2. Changing or disappearing under pressure. VI. Shape. <ul style="list-style-type: none"> 1. Apex. 2. Base. VII. Size. <ul style="list-style-type: none"> 1. Superficial. 2. Deep. VIII. Anatomical site. | <ul style="list-style-type: none"> C. SYMMETRY, <i>or asymmetry.</i> D. ACUTENESS, <i>or chronicity.</i> E. MOISTURE, <i>or absence of.</i> F. INDIVIDUAL LESIONS. <ul style="list-style-type: none"> 1. Elementary (<i>macule, papule, wheal, tubercle, tumor, vesicle, pustule, or bleb</i>). 2. Consecutive (<i>scale, crust, excoriation, fissure, ulcer, or scar</i>). IX. Consistence. <ul style="list-style-type: none"> 1. Firm. 2. Soft. X. Base. <ul style="list-style-type: none"> 1. Color. 2. Infiltration. XI. Evolution. <ul style="list-style-type: none"> 1. From sound skin. 2. From other lesions. XII. Career. <ul style="list-style-type: none"> 1. Transitory. 2. Persistent. 3. Type. <ul style="list-style-type: none"> a. Simple. b. Changing. c. Modified. XIII. Involution. <ul style="list-style-type: none"> 1. Resorption. 2. Exfoliation. 3. Ulceration. 4. Atrophy, etc. XIV. Sequelæ. <ul style="list-style-type: none"> 1. Stains. 2. Scars. |
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SPECIAL FEATURES TO BE OBSERVED IN CERTAIN LESIONS.

A. VESICLES, PUSTULES, OR BLEBS.

I. Roof.

1. Tense.
2. Flaccid.
3. Easily ruptured.

II. Contents.

1. Translucent, or *opaque*.
2. Serous.
3. Purulent.
4. Hemorrhagic.

III. Surface beneath.

IV. Areola.

V. Involution.

1. Desiccation.
2. Rupture.
3. Crusts.

B. SCALES.

I. Size.

II. Color.

III. Quantity.

IV. Consistence.

1. Dry.
2. Fatty.
3. Friable.
4. Tough.

V. Attachment.

1. Firm.
2. Slight.

VI. Surface beneath.

1. Color.
2. Dry.
3. Greasy.
4. Hemorrhagic.

C. CRUSTS.

I. Size.

II. Shape.

III. Color.

IV. Composition.

1. Serum.
2. Pus.
3. Blood.

V. Attachment.

VI. Thickness.

VII. Consistence.

VIII. Surface beneath.

D. EXCORIATIONS.

I. Distribution.

II. Shape.

III. Arrangement.

IV. Relation to other lesions.

V. Exudation.

E. FISSURES.

I. Distribution.

II. Size.

1. Length.
2. Depth.

III. Pain.

IV. Moisture.

F. ULCERS.

I. Size.

II. Depth.

III. Contour.

IV. Base.

1. Soft.
2. Infiltrated.
3. Indurated.

V. Edges.

1. Sloping.
2. Perpendicular.
3. Punched.
4. Ragged.
5. Everted.
6. Undermined.
7. Soft.
8. Indurated.

VI. Floor.

1. Smooth.
2. Uneven.
3. Clean.
4. Pus-covered.
5. Granular.
6. Sloughing.
7. Hemorrhagic.
8. Glazed.

VII. Secretion.

1. Scanty.
2. Profuse.
3. Serous.
4. Purulent.
5. Hemorrhagic.
6. Odor.

VIII. Pain.

IX. Crust.

X. Evolution.

XI. Duration.

XII. Involution.

(Note carefully the number and location of ulcers, the age of the patient, and the character of scars if present.)

G. SCARS.

I. Size.

II. Shape.

III. Color.

IV. Depression, or elevation.

V. Texture.

1. Soft, pliable.
2. Hard, indurated.
3. Thin.
4. Thick.
5. Smooth.
6. Rough, corded.

VI. Attachment.

VII. Deformity.

VIII. Subjective sensation.

IX. Absence or presence of hairs, glands, and papillæ.

VI. GENERAL PROGNOSIS.

THE prognosis of most diseases of the human body is formulated with a view to the decision of the serious question of life or death. Occasionally this question arises in connection with skin diseases. Many of the latter are trivial, some are grave, a few are inevitably fatal in their termination. Thus, general exfoliative dermatitis, leprosy, sarcoma, carcinoma, at times lichen ruber, and variola in the unprotected are of grave portent; while the ordinary congestions and exudations, the great majority of all cases of acquired syphilis in adults, and the entirely curable diseases induced by parasites do not excite alarm in the breast of the average patient with respect to his longevity.

The questions, however, as to his future, which are urgently pressed by the victim of cutaneous disease, are both numerous and important. He is anxious as to the time during which he must suffer; as to the possibility of conveying the disease to his progeny or other members of his family; as to the disfigurement of his person that may result; as to the scars which he may carry for the remainder of his life; as to the possible recurrences of his malady in the future. The responses to these questions will largely be influenced by the prognosis of the physician.

Some diseases of the skin are acute, pursue a rapid course, and are prompt to disappear. Others are chronic, rebellious to treatment of the most energetic and skilful character. Others, again, though not shortening life, are never relieved while life is continued. Some disappear only to reappear at more or less regular intervals. There are cutaneous diseases which affect one individual but once in his lifetime; others which reappear at the instant the patient is again exposed to their exciting cause. There are cutaneous diseases so distorting and destructive in their effects that their victims have committed suicide under the influence of the morbid emotions which have been as a consequence experienced.

The mental distress occasioned by even an insignificant cutaneous disorder is often out of all proportion to its exciting cause, and this should always be regarded in establishing a prognosis. The sexual hypochondriac has been made insane by an acne; and the man or woman affected with syphilis has been made wretched for years by a recurrent erythema.

Again, a disease of the skin may coexist with grave lesions of internal organs, and the prognosis of the disease of the one be greatly influenced by that demanded by the other; thus, there is occasional coexistence of syphilis and phthisis. Pruritus may be associated

with albuminuria; and the eczema of an infant starving for want of breast-milk may hasten its marasmus to a fatal termination.

Upon the answers given to his patient inquiring as to the prognosis of the disease of the latter, will largely depend the professional success of the physician. Scrupulous honesty should here be welded with all the skill that science can command. That a disease does not endanger life is not an argument in favor of its amenability to treatment. The practitioner should never suffer himself to be pushed by his patient to the position that an obstinate disease is readily manageable. It is the height of folly to estimate lightly that zoster of the forehead, the scars of which the patient may exhibit to all who afterward look upon his face both in life and in death. He who engages to relieve an alopecia areata in the month may have a year in which to repent his precipitancy. There is no way in which the conscientious physician can so readily secure the confidence of his patient, and with it that willingness to submit to appropriate treatment which is begotten of such confidence, as by demonstrating his ability to forecast the future of a disease; in other words, to describe accurately its prognosis.

VII. GENERAL THERAPEUTICS.

A CONSIDERATION of the subject of the methods of treating skin diseases in general suggests at once the intimate relation which subsists between the integument and other organs of the body. The etiology of one largely explains the causes of disease in all. The pathological processes in each are subordinated to the same general laws. The principles of treatment are very similar in all the disorders of the body.

The object to be attained by treating a cutaneous disease is, first, its complete relief; secondly, where relief is impossible, such management of the morbid process as will mitigate its severity and render the victim of the disease more comfortable. A higher and more scientific achievement than either is the prophylaxis by which man is enabled to escape the disease altogether. He can by his wisdom largely diminish the danger to which his integument is exposed; he can, to a certain extent, shelter himself from extremes of temperature, traumatism, toxic agents, and contagious diseases; he can, by observing the simple rules of hygiene, fortify his skin against the lesser evils which may befall it. Here, however, the subject under consideration involves disease which is actually present and in progress.

The management of diseases of the skin demands of the practitioner a sound knowledge of general medicine and an experience in disorders other than those of the integument. Dermatology is a branch of general medicine, and he who would succeed in the one department must at least be at home in the other. He who cannot succeed in the one field will almost surely fail to secure the best results in the other. Much indeed of the management of diseases of the skin can be correctly described as the pure practice of medicine. Many of the methods, most of the means of diagnosis, much of the pharmaceutical aid utilized by the general practitioner, are indispensable in the field of dermatology.

It is scarcely needful to set it down at this date that the old doctrines respecting both the danger of "driving in" certain diseases of the skin, and of the importance of "driving out" others, are relics of a superstitious ignorance. There is no disease of the skin the continuance of which offers a bar to other disorders or furnishes a guarantee of the future health of the patient. There is no disease of the skin which does not call for relief as promptly as the requirements and safeguards of science will permit. The retrocession of the exanthematous symptoms of a systemic poison are not of the class of involution of lesions to which attention is here directed.

In beginning the treatment of disorders of the skin it is scarcely

necessary to repeat that the diagnosis should be established by the methods already detailed; and that in attempting to adjust remedies to the morbid state due attention must be given to the past history of the complaint, to its remote or immediate causes, to its duration, to the nature of the disease (whether the latter has changed in type or severity since the beginning), and in particular to the special features presented at the moment of instituting treatment. The matter of diet is one with respect to which experts are not as yet upon all points agreed. In general it may be said that in all inflammatory affections the diet should include food which is simple, digestible, and free from excess of nitrogenous and hydrocarbonaceous principles. The diet appropriate for the gouty state in the majority of gouty patients suffering from dermatoses must be rigidly enforced, even admitting that too severe a regimen is to be deprecated for the gouty when not actually suffering from a crisis of the disease. In all attacks of urticaria the food permitted should be made to correspond carefully with the list of articles known to be incapable of aggravating the disorder, and too much importance cannot be attributed to the regulation of the food of infants and children affected especially with eczema. In glycosuric xanthoma, in the pruritus of albuminuria, in the tuberculoses of the skin, in acne cachecticorum, and in other disorders the selection of a dietary appropriate to the systemic state is of vital importance. On the other hand, it is to be conceded that in some cutaneous maladies, such as vitiligo, the disorders due to vegetable and animal parasites, in molluscum, and in other affections which might be named, the subject of dietetics is without importance.

Like all other diseases of the body, those of the skin may be divided into three classes with relatively fixed limits.

The first class embraces all the diseases which have a natural tendency to pursue their course to a favorable termination. It includes all those affections which, either mild or severe, require absolutely no treatment of an active character. It is the duty of the skilful physician to watch the evolution of these maladies, and to discharge a most important part by refraining from therapeutic measures which in such cases might prove hurtful. By his judicious counsel, also, he hinders patients and their friends from pursuing a course which might prove prejudicial to the disease.

The second class embraces all those skin affections which are either inevitably fatal or hopelessly remediless while life is prolonged. Fortunately, this includes but a small proportion of the large list. Here the duty of the physician is plain. He should assuage pain, attempt to relieve deformity, administer to the comfort of the afflicted in other ways, and by his patient courage inspire confidence and hope. It must not be forgotten that the skill of man has not yet reached the acme of human need. In the presence of many diseases of the body he stands absolutely helpless, and the speediest way to success in such cases is to begin by an honest admission of the plain fact.

The third class of affections naturally embraces all not included in the first two named. Here disease may be prolonged or be shortened in its course, rendered acute or chronic, made more or less endurable, permitted to become inveterate, or absolutely be relieved by prompt and energetic measures, according as it is, or is not, judiciously and skilfully managed. Here are gained the most brilliant successes of the dermatologist; here also occur his most humiliating failures.

In the presence of a cutaneous disease which requires treatment the question naturally arises as to whether this treatment shall be *internal*—that is, by medicaments ingested; or *external*—that is, by local therapeutics; or by combination of the two methods at the same time.

INTERNAL TREATMENT.

With regard to the question of internal treatment, which is one of pressing importance, it can safely be said that there are no remedies to be given by the mouth that can be described as certainly and specifically curative of the diseases of the skin. The number of medicinal agents employed with this end in view is incredibly large, by far the greater part being obtained from the vegetable kingdom. With few exceptions, some of which are enumerated below, the most esteemed of these agents exert only an indirect therapeutic effect upon the integument. The larger number of medicaments thus used are, it must be admitted, without value of any kind, but will probably continue to be vaunted as possessing specific virtue so long as credulity on the one hand, and avarice on the other, move the mass of mankind.

Arsenic has long stood at the head of the list of remedies as valuable, when ingested, for the relief of cutaneous disorders. It is known to exert its effects almost exclusively upon the epithelia of the skin, and upon these, so far as therapeutic effects are concerned, only when they are the seat of subacute and chronic exudation. Upon the acutely inflamed epidermis the action of arsenic is unfavorable. If given for long periods of time, it may produce a generalized pigmentation and, occasionally, a generalized hyperkeratosis of the skin. It frequently produces excessive keratosis of the palms and soles, which in special cases has terminated in cancer of the skin. Operating favorably in this limited class of cases, it also operates slowly, requiring months for the production of its curative effects. Its administration is attended at all times with the hazard of producing toxic effects, which, however, when the result of the exhibition of the drug in medicinal doses, are limited usually to a mild exanthem upon the skin, moderate coryza, and some redness from congestion of the vessels in the eyes and eyelids.

Arsenic is used chiefly in psoriasis, acne, squamous eczema, pemphigus, and lichen ruber, its doses in case of children being relatively large. It should be administered only after eating, and a

minimum dose first be employed in order to test the susceptibility of the patient to its action. It should be remembered that the toxic effect of this, as also of several of the other drugs mentioned below, is often speedily noticed after the first exhibition of a relatively small dose. Toleration once established, the dosage may be cautiously increased.

The forms in which arsenic is usually administered are: the preparations of arsenous acid, such as the popular tablet-triturations made up in different and most commonly administered doses; the liquor potassii arsenitis (Fowler's solution); the liquor arsenici et hydrargyri iodidi (Donovan's solution); the liquor arsenici chloridi (de Valangin's solution); and the Asiatic pill. Duhring's modification of this pill is obtained by making 2 grains (0.13) of arsenous acid, and 32 grains (2.13) each of black pepper and licorice powder into thirty-two pills by the aid of a sufficient quantity of gum Arabic and water. Arsenic is also at times advantageously combined with other indicated medicinal substances, such as iron and potassium iodide.

An unprejudiced view of the value of arsenic, even in cases properly selected for its internal administration, justifies the conclusion that it is in diseases of the skin a remedy of uncertain effect, and in that proportion disappointing. After collation of the experience of experts it has been shown that the common practice of giving arsenic in many cutaneous diseases in both harmful and irrational, not merely because of its effect in inducing cutaneous congestion and pruritus, but also because of the reliance placed upon it to the exclusion of other and better methods of treatment; and that the beneficial effects supposed to follow its administration are often due to other causes. No series of carefully recorded cases has ever been published in which notable therapeutical results have been shown to result solely from its administration. Even in pemphigus, psoriasis, chronic eczema, and lichen ruber, in which arsenic has been thought to possess special efficacy, it has in cases conspicuously failed.

It is safest to conclude, first, that arsenic, instead of being one of the earliest, should be one of the last remedies to be selected in the management of cutaneous diseases by the general practitioner; secondly, that, when thus selected, its value will probably prove greatest if the eruptive lesions be seated superficially, be generalized, diffused, or in evident association with neurotic symptoms; thirdly, that in any case its failure to relieve should not be regarded as definite, if only Fowler's solution has been administered.

Sodium Cacodylate.—This drug is an organic compound of arsenic and may be used where arsenic is indicated. It is claimed for the drug that large doses may be used without irritating effects whether exhibited hypodermatically or per os. It has been found of value in the treatment of psoriasis, lichen planus, dermatitis herpetiformis, etc. The dosage should be smaller than commonly recommended even though it has the reputation of being nontoxic.

A safe quantity to begin with ranges from grs. $1/30$ (.002) to grs. $1/15$ (.004) given three times daily after food.

Atoxyl (*Meta-arsenious-anilide*).—This drug has given brilliant results in syphilis, psoriasis, dermatitis herpetiformis, lichen planus, pemphigus, etc. It has been exhibited in dosage much greater than other preparations can be given. Neisser has demonstrated its value in syphilis in apes. While it appears to be a preparation of great merit, it is not without danger as untoward results recorded demonstrate. It is given hypodermatically in doses up to three grains (.2) once in three days. Great caution is recommended in its use.

Mercury is a remedy of great value in cutaneous as in other affections. Its specific action upon the liver and intestinal secretions calls for its employment in many cases in which intestinal elimination is deficient, in which there is habitual constipation, and in which there is a decided tendency to congestion of the blood-vessels of the head, of the anogenital region, and even of the lower extremities. In all of the distinctly gouty dermatoses, in all eczemas of the florid-faced type of patients, in many cases of intense pruritus resulting from toxic influences, and in almost all the eczemas of infancy and childhood, calomel, blue pill, and the gray powder are well nigh indispensable in securing the speediest and happiest results. Indeed, there are few adult patients seeking relief from a simple inflammatory affection of the skin and having at the same time a coated tongue, an offensive breath, and a loaded colon, who will not be benefited at the outset of treatment by free catharsis under the influence of a mercurial. In many cases indeed of aggravated types of engorgement of the skin, localized or generalized, a dose of blue mass may be given at night, on successive nights, or for a fortnight or more, and followed by a saline laxative in the morning, with the best effect upon the exanthem present.

Mercury in the treatment of syphilodermata is of incontestable value, and its injudicious employment in many cases springs from that precise fact. The vulgar prejudice that many disorders of the skin, really not syphilitic, are obscure manifestations of lues in a preceding generation and amenable to mercurial treatment, is a striking illustration of the necessity of accurate diagnosis in cutaneous diseases. When syphilodermata are present corrosive sublimate is often superseded, in consequence of its irritative effects, by the compounds of the metal with iodine. The gray powder is useful chiefly in case of infants and children, though its occasional development of the corrosive chloride has limited its employment. Calomel and the mercurial pill should be employed only for transient effect, as when administered for long periods they are much more than the other preparations mentioned likely to produce ptyalism.

Iodine.—This drug and its compounds are also chiefly used in syphilitic disorders of the skin, but they possess a wider range of value than the mercurials in the treatment of other cutaneous affections. Here, too, the abuse of the drug furnishes a long list of cu-

taneous disorders either originated or aggravated by its employment. As in the use of arsenic, toleration should be established before large doses are exhibited. The compounds chiefly used are the iodides of potassium, sodium, lithium, and ammonium; iodo-nucleoid, iodipin, and iodoform. Iodine has been administered for the relief of the scrofulodermata, lupus, keloid, psoriasis, and syphilitic affections of the skin. As to the latter, it may be added that in the earlier symptoms of lues it is often a source of positive injury.

Cod-liver Oil.—This oil is a remedy of special value in diseases of the skin, and was for that reason held in high favor by the distinguished Hebra, though its action is almost exclusively that of a nutrient of the general system. It is employed chiefly for its roborant effects, which are similar to those of the digestible aliments. Its special value in the treatment of infants and children affected with cutaneous diseases cannot be questioned. It is moreover, of great use in maturer years and is advantageously exhibited in eczema, lupus and other tuberculous affections, syphilis, scleroderma, and in all disorders of the integument accompanied by wasting.

Cathartics, Alkalies, and Diuretics.—These have an important place in the list of remedies valuable in the management of skin affections. Cathartics are chiefly valuable in eliminating effete or toxic products, but they are effective also in reducing congestion of the body-surface. The value of mercurials in this connection has been already suggested. The saline laxatives and cathartics also are of great service, especially the magnesian and sodic sulphates, and the Rochelle, Carlsprudel, and Hunyadi János salts. The useful and frequently ordered *mistura ferri acida* is compounded as follows:

R	Magnes. sulphat.,	ʒjss;	45	
	Acid. sulph. arom. (vel dilut.),	ʒj;	4	
	Ferri sulphat.,	gr. viij;	50	
	Aq. menth. piper.,	ad ʒiv;	120	M. (filtra).
Sig. A tablespoonful in hot or cold water before breakfast daily.				

The alkalies are extremely useful in all cases of gouty disorder, and in erythema, acne, and certain forms of eczema. The carbonates of sodium, potassium, and lithium are chiefly employed, as well as the liquor potassæ. The prevalent misconception of the value of lithium carbonate and other salts of the same base has produced a reaction which suggests a preference of one of the other alkalies when such are indicated. Diuretics, with the exception of water, are less valuable in cutaneous than in other affections, but they yet are administered often with special advantage in inflammatory disorders.

Water.—Water when drunk in sufficient quantities and at proper times is of great value as a diuretic and as an aid to elimination. Soft water is to be preferred, and should be drunk freely at all times except during meals and for an hour after eating. The best results are obtained by drinking a given amount (four to eight, or more, ounces) every hour. As such a course is usually impracticable outside of hospitals and health-resorts, under ordinary circumstances

two or three glassfuls may be ordered to be taken on rising in the morning and before meals. The free use of water, especially if iced, with meals is a fruitful source of indigestion as a consequence of the chilling and large dilution of the stomach-contents. The vicious habits of rapid eating and imperfect mastication of food may often be corrected by simply abstaining from the drinking of liquids during the taking of food.

Quinine, administered both as a tonic and an antiperiodic, is largely employed in cutaneous medicine for its generally recognized systemic effects. It produces, in susceptible individuals, a peculiar smoothness and softness of the skin, which usually disappear when the drug is suspended. Like arsenic and iodine, it is occasionally the cause of a generalized exanthem, and is capable of producing other toxic effects, such as failure of the heart's action, dizziness, and tinnitus aurium, symptoms recognized under the designation of *cinchonism*. It will, of course, exhibit its happiest effects in malarial affections with coincidence of cutaneous symptoms and in diseases of the skin associated with a neurosis. The value of the administration of the quinine muriate, in very large doses to the point of tolerance, in some forms of general exfoliative dermatitis, is described in the chapter devoted to that subject.

Salol.—This is a remedy of special value in many cutaneous disorders associated with intestinal sepsis. It is particularly useful in the forms of pustular acne when the subject of the affection has an habitually coated tongue, a foul breath, and defective digestion. It is also of value in certain angio-neurotic disorders induced by intestinal putrefaction indicated by indicanuria.

Ergot and Ergotine, whether by exerting an effect upon the muscle-bundles or the vessels of the derma, or upon the uterus, or yet by influencing the general economy, are thought to possess some value in the treatment of several cutaneous diseases occurring in both sexes. Such are acne, purpura, and a few other disorders.

Calx Sulphurata.—This sulphur compound was once regarded as the most efficient of its group for internal use in cutaneous diseases. Its supposed value in furunculosis has led to its employment also in eczema, acne, and impetigo. It is given in doses of from $\frac{1}{16}$ (0.004) to $\frac{1}{4}$ (0.016) of a grain, three or four times daily. It is, however, a remedy uncertain in operation and of dubious effect.

Chrysarobin.—This drug has been administered internally by Stocquart¹ and others, in doses of $\frac{1}{4}$ (0.01) of a grain, for a number of cutaneous disorders.

Ichthyol, mentioned later as of some value when externally employed, has also been given by the mouth.

Jaborandi and Pilocarpine, probably as a result of the free diaphoresis which they excite, unquestionably exert immediate therapeutic effects in a number of cutaneous disorders especially the angio-neurotic group.

¹ Annales, 1884, s. ii., v., p. 15.

Sulphur, highly esteemed as a popular remedy in cutaneous affections, exerts but little influence upon the latter when it is ingested. Its cathartic effect is the chief reason for its administration. It is recommended by Crocker in some of the disorders of the sweat-function.

Antimony in small doses is of unquestioned value in many diseases of the skin. It is, when not contraindicated, employed with advantage in psoriasis, pruritus, and some of the obstinate forms of eczema.

Tar, Carbolic Acid, Creosote, Guaiacol, Resorcin, Turpentine, Copaiba, and Phosphorus.—These remedies have been employed internally with appreciable effect in certain cutaneous maladies. They have been used with advantage in cases of lupus, eczema, psoriasis, and pruritus; but the disagreeable effect of their internal administration has been to a great degree a bar to their general employment. The “perles” of phosphorus and the elixirs of the same drug obviate this difficulty in the instance of at least one of these articles. Creosote carbonate given in capsules is usually well tolerated.

Animal Extracts, Thyroid Extract.—These and other preparations of the thyroid, adrenal, and other glands of the larger mammals, have in recent years been employed largely in various diseases of the skin. In myxœdema decided and brilliant results have been obtained, and they possess some value in ichthyosis, psoriasis, and a few tuberculous affections of the skin. The depressing action of thyroid-extract on the heart makes it an unsafe remedy to use except with caution.

Maltine, and other preparations of malt alone or in the valuable combinations on sale, are of marked value in promoting the nutrition of the skin. They are especially indicated where there is imperfect digestion of the carbohydrates, and where fats are not readily assimilated. They are useful in acne, in scleroderma, in syphilis, in tuberculosis of the skin, and in many of the cachexias accompanied by cutaneous symptoms.

Iron.—This metal and its several compounds are invaluable in the management of a long list of cutaneous disorders. Iron is indicated in many cases of cachexia and struma; in tuberculosis of the skin; in syphilis; in all the anæmias; and in many cases of purpura and pemphigus. Fortunately, iron is often well assimilated when compounded with other drugs, and hence has been suggested the long list of compounds of iron and mercury and of iron and iodine in syphilis; of iron and quinine and of iron and the vegetable bitters in anorexia and anæmia; and of iron with cathartics in atonic constipation.

Analgesics have occupied a small space in cutaneous medicine, and that space should be more and more restricted. The use of acetanilid, of opium and its alkaloids, of phenacetine, of potassic bromide, of trional, of sulphonal, and of articles of the same class, has been indicated for relief of the tormenting pruritus, pain, and

insomnia accompanying a long list of dermatoses. Unfortunately, most of the preparations devised to insure relief, after a temporary calmative effect have a decidedly aggravating influence upon the exanthem present. To a degree scarcely noticeable in other cases have drug-habits been formed in consequence of the temporary assuagement of the local distress when under the influence of an analgesic. As a rule, the most competent physician is he who secures relief for his patient without narcotizing the nerves which are uttering their protest by abnormal sensation. The expert reserves for the last extremity an ordering of medicines of the anodyne class in attempting to secure relief.

Hypodermatic and Intracutaneous Injections of alcohol, arsenic, mercury, cocaine, carbolic acid, the alkaloids of opium, antitoxins, exalgine, of erysipelas-toxins, and other substances have been largely employed in the management of cutaneous disorders, some with marked success, others with doubtful results. The most brilliant of the achievements in this direction are without question the relief of the syphilodermata by deep intramuscular injections of mercury. The injection of the antitoxins¹ which have been such a boon in an important group of general disorders has, on the whole, proved disappointing in cutaneous medicine. Attention has been directed to the special objections in most of the affections of the skin to the use of anodynes and opiated medicaments by whatever route introduced into the system. The temporary alleviation, when secured, is gained at too great a cost.

Thiosinamine, Taurine, and yet other substances have been injected subcutaneously in the management of lupus, acne, eczema, psoriasis, lepra, and other affections. They have not as yet such an acceptance at the hands of the profession as would justify their employment in any save specially selected cases.

Opsonins.—During the past few years opsonotherapy has attracted wide attention. In dermatology it is applied chiefly to infections induced by the staphylococcus and tubercle-bacillus. The chief disorders so treated are furunculosis, acne vulgaris, sycosis, lupus vulgaris, and scrofuloderma. Of those named above, lupus vulgaris seems most rebellious to the treatment.

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¹ See opsonins.

The method was largely perfected by Wright and Douglas of London. To be properly carried out much time and good laboratory facilities are essential. The method essentially consists in injecting hypodermatically definite quantities of sterilized cultures of bacteria isolated from the affected patient.

It is proven that the serum of the blood contains substances which render bacteria susceptible to phagocytosis by the polymorphonuclear leucocytes; these substances Wright termed opsonins. The term is derived from a Greek word meaning "to prepare food," "to cook." As phagocytosis is the important feature in overcoming these infections, the quantity of opsonins becomes important.

For comparison in the work, the quantity of opsonins in a normal individual is denoted by: 1. As a rule in an infected patient they are reduced to .3, .4, .6, or .8; in other words are less than normal (exceptions to this occur).

The opsonic index refers to the ratio between the amount of opsonins in the serum of an individual suffering with a bacterial infection and the amount in the serum of a normal healthy person.

Wright says: "Vaccines are any substances that on being inoculated into the body will cause the generation of a protective substance." His vaccines consist of bacterial bodies.

Two difficult problems are presented: first, the determination of the proper dosage, and second, the time-interval between the injections.

Immediately following inoculation the amount of opsonins is diminished (negative phase). This period varies according to the size of the dose and other circumstances. This period is followed by an increase and by a rise in the index (positive phase). After a varying time, the index begins to fall again but does not descend to its former low level. Therefore, by properly regulating the size of the dose and repeating it at the right interval, the amount of protective substances may be kept abundant as indicated by a high index and clinically by improvement in the symptoms.

The Preparation and Standardization of Bacterial Suspensions for Therapeutic Injection.—The size of the dose in the therapeutic injection should always be controlled by an approximate knowledge of the actual number of bacteria.

The method of standardizing the suspensions as originally devised by Wright is to be recommended.

It consists (1) of thoroughly mixing equal parts of an even, rather dense bacterial suspension in NaCl solution and a known blood; (2) of making and staining a thin smear; and (3) of determining the relative number of red blood-corpuscles and bacteria in five or more fields under the 1/12 objective. From this the number of bacteria per c.c. can readily be determined.

Example:—Suppose that in a given case the red blood-cells are five times as numerous as the bacteria. It is previously determined that the sample of blood used contains 5,000,000 erythro-

cytes per c.mm. Hence the number of bacteria is 1,000,000 per c.mm. or 1,000,000,000 per c.c. If 50,000,000 are to be injected one may inject 1/20 c.c. diluted with b.s. NaCl sol.

Essentials in the Determination of the Staphylococcus Opsonic Index.—

(1) An even suspension in NaCl of a 24-hour culture upon agar of the proper density. This is best obtained by suspending some of the growth from agar slant and then centrifuging down the clumps. A 24-hour-old-broth culture also answers this purpose.

(2) Washed leukocytes or washed blood for phagocytes.

Ten or more drops of blood are obtained from a prick in the ear and suspended in a two per cent. sodium citrate solution contained in and nearly filling an ordinary electric centrifuge tube. This is then centrifuged thoroughly until both the red and white corpuscles are thrown down. The citrate solution is now poured or pipetted off and normal NaCl solution added and the corpuscles suspended and then again sedimented. This is usually repeated once more. The salt solution is decanted and the top layer containing a large percentage of the white corpuscles is pipetted off and thoroughly mixed and placed in a small test tube. This is designated in general use as the "washed blood," "washed leukocytes," "blood cream," etc.

(3) The Sera.—The "normal pool" of equal parts of three or more normal sera as well as the patient's serum are best obtained in small u-tubes from a prick of the finger or the ear. After five to ten minutes when clotting has taken place, the clot is separated from the serum by placing the tubes in the centrifuge sockets and centrifuging for four or five minutes at high speed.

The method of obtaining the blood and mixing the three essential factors by Wright's method is complicated and requires not a little skill in preparing the necessary glassware. The method evolved in Hektoen's laboratory by the use of the simple tube and a small capillary pipette which is bent at right angles, is simple as well as accurate. A special incubator is entirely unnecessary.

After mixing the pool of normal sera, a small amount is drawn up the capillary tube for a distance of apparently two inches. This point is marked with a glass pencil or a bit of India ink. A small bubble of air is drawn in the end. When the washed blood, and in like manner the bacterial suspension, is drawn to the point marked above, in this way equal parts of the three necessary factors, (the serum, the washed blood, the bacterial suspension) are obtained and then thoroughly mixed by drawing them back into the wider portion of the pipette five or more times. The second pipette is now prepared. It contains the patient's serum, the variable factor. Both pipettes are now placed in the thermostat at 37 degrees and incubated for fifteen minutes.

Smears are now made after mixing thoroughly and the average number of bacteria contained in at least fifty leukocytes determined. This indicates the relative opsonic power of the normal and patient's sera.

From this the opsonic index is determined by dividing the result obtained where the patient's serum was used by the result obtained where normal serum was used.

For example: If the count where normal serum was used shows that an average of four staphylococci was taken up per leukocyte and where the patient's serum was used shows five; the opsonic index of the former is normal or unity, that of the latter $5/4$ or 1.25. Any of the polychrome blood-stains may be used to stain the smears. Two per cent. carbol-thionin solution in methyl alcohol is satisfactory.

Spraying.—Spraying the skin for antiseptic purposes is of value, and may be often employed with marked advantage. The several solutions of formalin are best suited to the purpose. Frigorific sprays for the purpose of freezing a part of the skin selected for operation, as in the case of epithelioma, are indispensable to the operator. Those chiefly employed are discharged from bulbs containing ethyl chloride.

Natural Mineral Waters.—The chief value of many of the mineral springs and health-resorts of the United States, lies in the change of manner of living that they invite and necessitate. Sunshine, pure air, recreation after the care and toil of business, change of climate, of foods and drinks, and even of cooks, often decide the question of speedy recovery. Unfortunately, both in America and in Europe, many of the health-resorts are peopled by unscrupulous charlatans, with a tendency to attribute all the benefits to be derived from these sources to the medicinal virtues of this or that particular spring, aided always by treatment according to their own peculiar methods. Many patients affected with disease of the skin are thus made worse by a temporary residence at noted health-resorts, and, therefore, it is often the case that a visit to the seashore, to the mountains, or to any healthful place in the country proves conducive to greater practical results. None the less the springs of America and Europe having mineral constituents, in many instances supply a valuable means of treating cutaneous diseases. The sulphur waters of Richfield Springs, of Sharon Springs, and of Avon Springs, in this country, as of those of Europe, operate chiefly by an influence exerted upon the digestive tract; the springs of West Virginia are examples of calcic waters having for the most part a diuretic effect. The fine water of the Poland Spring in Maine is chiefly valuable by reason of its remarkable purity. The alkaline waters of Colorado Springs, of Saratoga, and of other sources in America are rapidly securing a reputation equal to that of the famous Vichy, Carlsbad, and Ems of Europe.

The chemical laboratories, however, are fast placing at the disposal of the consumer the salts, either natural or artificially produced, which represent the constituents of most of the mineral waters highly esteemed both here and abroad, in the management of disease. In this way the Apenta, Hunyadi János, Hathorn, Kissengen, Congress,

Friederichshall, Rakoczy, and other waters may be produced at will by solution of the proper salts in water: and the latter in many of our large cities is now furnished after distillation and aëration in such purity that it competes with distilled water in the laboratory of the chemist and in the operations of the photographer.

Of the chalybeate and arsenical waters, the former abundant in Michigan and New York, the latter best represented by that of Levico, in the Austrian Tyrol, it may be said that their use is often followed by excellent results, especially when the drinking of the water is associated with the tonic regimen and healthful environment of the springs from which these waters are obtained.

EXTERNAL TREATMENT.

In the external treatment of diseases of the skin the indications are to hasten repair when this is possible; to alleviate distress if palliatives only are admissible; to destroy absolutely or excise the diseased tissue when this is justifiable. The following are the principal substances employed as external applications:

Water, either pure or medicated by holding substances in solution or mechanical suspension, is applied either in baths or as lotions. Baths, local or general, may be employed for days continuously or but for a few moments at a time. They are given with water varying in temperature—cold, warm, or hot. Rain-water is to be used when practicable.

Cold baths of short duration are generally followed by a sharp reaction, the skin becoming congested after the normal temperature of the surface is regained. It is for this reason that cold sponging of the inflamed skin is usually grateful so long as it is continued, and is succeeded by an aggravation of the symptoms which it was intended to relieve. Continuous applications of cold water are not open to this objection.

Hot baths are followed by a more or less enduring relaxation of the integument, while tepid water-baths are chiefly macerative of the surface. Hot baths are valuable in several of the exudative and hypertrophic affections of the skin. The application of watery lotions to the broken surface of the skin is likely to be followed by endosmosis, unless the specific gravity of the serum of the blood and that of the fluid of the bath or the lotion are nearly the same. This imbibition of fluids by the broken skin is accompanied by slight swelling of the tissues and is productive of disagreeable sensations.

The continuous warm water-bath in which the patient is immersed either for the greater part of a day or for a few hours at a time is an exceedingly valuable means of treating pemphigus, the severe grades of burns, and ulcerative affections of the skin.

The most perfect of all applications of water to the surface of the body is that most resembling the water-bath in which the tender skin of the fœtus is immersed for consecutive months. Here the bath is

continuous; the temperature is that of the viscera of the living animal; and the delicate skin of the unborn child is anointed with a fatty substance which interferes with the macerative action of the surrounding fluid so long as vitality is preserved at the average standard. The comfort and therapeutic value of a bath prepared and administered in approximation to this ideal can scarcely be overestimated. Were it not for the difficulties with which it is attended, so far as relates to many portions of the surface of the body, it would be possible with this single therapeutic measure to rob the exudative affections of the skin of many of their formidable features.

Vapor, steam, Russian, and Turkish baths are less valuable than is usually supposed in diseases of the skin. The macerative effect they produce is not always desirable. They possess some value in severe general pruritus, in ichthyosis, and in keratosis pilaris.

In acute inflammations of the skin the application of pure water, even when of proper temperature, is often prejudicial to the integument, and soap-and-water washings may prove quite harmful. The greatest caution must be exercised in giving instruction to patients as to the washing of the inflamed skin.

Water for external application, as in the bath, is medicated by the addition of a large number of substances, such as marine salt, boric acid, corrosive sublimate, sodic and potassic salts, alum, tannin, the mineral acids, gum Arabic, gelatin, and bran.

The alkaline bath, made by adding sodium bicarbonate or baborate to water having the proper temperature in the proportion of 12 ounces of either salt to 30 gallons, is usually grateful to the inflamed skin. Sulphur-baths are best prepared by adding an ounce of Vlemineckx's solution¹ to the above-mentioned quantity of water.

Baths.—Sulphur-baths.—The natural sulphur-baths of Richfield Springs and Avon Springs, in this country, are efficacious in certain cutaneous affections accompanied by roughness and thickening of the integument.

Tar-baths.—Tar-baths are usually given by first anointing the skin of the patient with the tarry substance to be employed, and by immersing the body in warm water for some hours afterward. The resulting effect can usually be accomplished as well by other measures.

Salt- and Marine Baths possess the highest value with respect to the general health of the individual; and are advantageously employed over the body-surface when, for example, the head alone is affected with a dermatosis (rosacea, acne, erythema), and when the salt is not brought into contact with the morbid surface. In very many cases a sea- or salt-bath produces aggravation of a cutaneous

¹ The formula is:

R	Calcis,	3ss;	16	
	Sulphur. sublim.,	3j;	32	
	Aq. dest.,	3x;	320	M.

Coque ad 3vj [200] deinde filtra.
Sig. "Vlemineckx's Solution."

affection, and indeed, in some cases, is capable of begetting the same. A properly directed salt-bath or lotion, however, is at times positively beneficial, not merely in chronic, but also in acute affections of the skin.

The strength of the usual marine salt-bath is $\frac{1}{4}$ pound to the gallon, though 10 pounds of the salt are often added to 25 gallons of water with advantage. The sea-salt is not preferable to the article obtained from the natural brine-wells of the interior of the country. For invalids the skin of the body may first be well rubbed with the finest table-salt well warmed in an oven, after which a tepid or warm bath may be used to cleanse the surface.

Antiseptic Baths.—These baths are most often employed by the surgeon. In the management of skin-affections local baths of boric acid in hot or cold water may be employed. The acid is soluble in about 25 parts of cold water. Corrosive-sublimate baths are employed in the strength of 1 drachm (4.) of the mercurial to 30 gallons of water. Local baths thus medicated are often employed in the cleansing of ulcerated and suppurating surfaces with a view to subsequent dressing.

When employed as a lotion, water is made to produce a sedative effect by the addition of opium, belladonna, glycerin, carbolic acid, hydrocyanic acid, zinc, bismuth, mercury, lead, and alkaline bicarbonates with the sodic baborate. It is rendered stimulating by the admixture of alcohol, most of the acids and alkalies in stronger solution than in the soothing or sedative lotions, and also by a large number of substances which operate upon the surface either mechanically or chemically. Water is also rendered astringent when tannin, lead, and similar medicaments are dissolved in it; and by its union in various proportions with soaps and alkalies a solvent effect is produced, either upon the cuticle itself or upon pathological or foreign products upon its surface.

Soaps.—Soft soap (*sapo viridis*, *sapo mollis*) made by the addition of caustic potash in an excess of between 3 and 4 per cent. to an animal fat, is a substance exceedingly useful in the treatment of skin diseases. It is used for the purpose of producing either a detergent or stimulating, and at times a slightly destructive effect either upon the surface of the skin itself or upon pathological accumulations upon the surface (crusts, scales, etc.). It may be used as a plaster or with water: and this last either in substance or by the aid of the widely known "*Spiritus Saponis Alkalinus*" which Hebra first devised: 2 ounces (64.00), of green soap to 1 ounce (32.) of alcohol, flavored with spirit of lavender. The hard or soda soaps are employed chiefly for toilet purposes.

"Over-fatty" or "superfatted" soaps, both soda and potash soaps, are neither alkaline nor neutral in reaction, but contain a slight excess of unsaponified fat. They are exceedingly mild in their detergent action upon the skin, though the lather produced in their use is not so abundant as that with the alkaline soaps. These are usually proprietary articles.

Medicated Soaps, containing carbolie acid, glycerin, tar, sulphur, and various oils, are sold in the shops; but they usually contain so small a portion of the individual medicament from which each is named that they are practically worthless except for purposes of ablution. Under cold pressure they may be made to contain medicinal substances in therapeutic proportions, but other forms of administration of such medicaments are preferable.

Fatty and Oily Substances are applied to the skin either directly by pouring, or by friction, or by the mediation of compresses, bandages, etc., which are saturated or are spread with the material to be applied. The oils may be used for either nutritive, soothing, or stimulating effects. To the first and second classes belong cod-liver, lard, olive-, almond-, linseed-, neat's-foot, castor-, and similar oils; to the third class belong the oil of tar, of cade, of white birch, of the cashew-nut, and of juniper.

Fatty substances are also applied in the form of ointments or pomades. They are compounded with various medicinal substances, according to the requirements of each case, such as the salts of mercury, zinc, copper, lead, and sulphur; pyrogallol, chrysarobin, carbolie and hyposulphurous acids; tar, camphor, iodoform, balsam of Peru, chloral hydrate, and the extracts of opium, belladonna, etc.

Vaselin.—The products of petroleum refinement represented by this ointment, though not true fats, are employed increasingly for similar purposes. They are particularly useful as bases for ointments for application to the hairy portions of the body, such as the scalp, where more consistent salves paste the hair to the surface in an unsightly mass.

In the class of soothing ointments which are required in many cases in which the skin is the seat of a severe pruritus or of burning sensations, may be named the diachylon, benzoinated zinc-oxide, "cold-cream," lanolin, cucumber, petroleum, spermaceti, cacao-butter, and olive-oil with vaselin ointments. Those medicated with the several oleates and with the salts of bismuth, zinc, or lead, are often of great value. As a rule, however, in most cases calling urgently for soothing applications fat-containing dressings are not to be preferred to lotions or dusting-powders, or the two last named in combination. Ointments are rubbed gently over the affected surface, but they are more efficient when spread on bits of soft muslin and kept in contact with the skin.

McCall Anderson's ointment has long been employed for soothing inflamed surfaces. It is compounded by adding 1 drachm of bismuth oxide (4.) to 1 ounce (32.) of oleic acid, 3 drachms (12.) of white wax, 9 drachms (36.) of vaselin, and a few minims of the oil of roses. 10 parts of lanolin, with 20 of lard and 30 of rose-water, make another useful combination. Many of these ointments have been found to be irritating on account of the fatty acids which they develop, especially in hot weather. They may be kept sweet by the addition of a small quantity of formalin to each jar compounded.

The following formulæ are also useful: Boric acid, white wax, and paraffin, each 10 parts; oil of sweet almonds, 60 parts (H. Hebra); Bismuth oxide, 1 drachm (4.); white wax, 6 drachms (24.); vaselin and olive-oil, of each 1 ounce (32.); Boric acid, 1 part; glycerin, 24 parts; anhydrous lanolin, 5 parts; vaselin, 70 parts (Duhring's "boroglycerin cream ointment"). Other fatty applications are prepared by adding olive-, sweet-almond, or cotton-seed oil, as well as lard and lanolin, to lime-water in nearly equal proportions. These furnish a thick emulsified substance which requires to be well shaken before application. Any one of these emulsions may be medicated at will by the addition of zinc, bismuth, calamine, or other insoluble substance which is mechanically mixed with the fatty emulsion when the whole is well shaken.

Stimulating ointments are usually made by the addition of such substances as tar, mercury, resorcin, salicylic acid, pyrogallie acid, chrysarobin, or sulphur to any one of the several salve-bases in common use.

Glycerin, even the best, when applied in its purity to the skin is usually irritating. It is, however, exceedingly useful when diluted or made a component part of lotions and ointments. When combined with starch in different proportions it makes a series of combinations known as *glyceroles*, or *glycerolates*. These combinations are pasty, semisolid substances which are capable of varied medication, as in the glycerole of lead subacetate. They are useful chiefly as protectives of the skin-surface. Glycerin, used in a fluid soap, is an exceedingly valuable agent when a milder effect is desired than that produced by the spirit of soap described above. The Vienna preparation known as Sarg's fluid soap is an admirable substitute of this sort when a soft shampoo is required for the scalp.

Pastes employed for local application in diseases of the skin have greatly been perfected by Lassar and Unna.¹

These pastes are valuable especially in the exudative affections, in which salves are often either not well tolerated or actually prove irritating to the skin. The pastes, when applied to such surfaces, form a protective and adhesive dressing, which may be medicated as desired. One of the best and most serviceable pastes is:

℞	Zinc. stearat. cum acetanilid.,	} āā 3ij	8	M.
	Ol. oliv.,			
	Unguent. aq. ros.,			

Or the following modification of Lassar's paste:

℞	Zinci oxidi, }	āā 3ij;	8	66	M.
	Talc., }				
	Acid. salicylic.,	gr. x;			
	Vaselin.,	ʒss;	16		

Equal parts of lanolin, vaselin, talc, and zinc oxide form a base that is stiffer than the preceding and adheres better. To these bases may be added various remedies in desired proportions.

¹ Monatshefte, 1884, iii., p. 38.

Duhring's modification of the original Lassar paste is: boric acid, ʒj (1.33); starch and zinc oxide, each ʒij (8.); vaselin, ʒj (32.). Unna employs: starch, 3 parts; glycerin, 2 parts; water, 15 parts; boiled down to 15 parts. Half the quantity of any desired medication may be added to the amount ordered. Paraffin may be added in the making of very stiff pastes in the proportion of equal parts of this substance and water; twice the quantity of lanolin; and about $\frac{1}{25}$ of white wax.

Other pastes are prepared with kaolin (terra alba, or Armenian bole, of red color when it is desirable to have the application resemble the color of the skin), gum, lead, dextrin, glycerin, and other substances. Formulæ for each are appended.

Kaolin in a pure state, with equal parts of vaselin or glycerin, or with almond-, olive-, or linseed-oil, in the proportion of two to one, is readily applied in a thin layer over the skin.

For making lead-pastes, litharge is boiled with twice the quantity of vinegar until the latter has evaporated and there is left a damp but drying paste, which on occasion, may be remoistened with a small quantity of vinegar.

℞ Lithargyr. subt. pulv.,	ʒjss;	45
Aceti,	ʒijss;	75
Coque usque ad consistent. pastæ: deinde adde ol. lini [v. glycerini, v. ol. olivæ], 10.—M.		

In the two forms of paste above described the adhesive and desiccative qualities are obtained from the main ingredients, but in those resulting from combinations of gum, starch, and dextrin these results are for the most part obtained by the addition of other ingredients, such as sulphur, zinc, etc. A good basis, semisolid, rapidly drying, and fixing its ingredients well upon the surface, is the following:

℞ Zinci oxidi,	ʒjss;	45
Acid. salicylic.,	ʒss;	2
Amyli oryzæ, }	āā ʒiiij;	12
Glycerini, }		
Aq. dest.,	ʒijss;	75
Coque ad., ʒivss (145).		

For a sulphur-paste:

℞ Sulphur. præcipit.,	ʒjss;	45
Calc. carb.,	ʒss;	2
Zinc. oxid.,	ʒss;	15
Amyli oryzæ,	ʒiiij;	12
Glycerini,	ʒss;	15
Aq. dest.,	ʒijss;	75
Coque ad., ʒiv (120).		

To make use of dextrin, the official pulverized article is selected, and a simple paste of this forms a good drying base. An added half-weight of glycerin is required if powders are also combined with the paste—*e. g.*:

℞ Zinc. oxid.,	℥jss;	45	
Dextrin., }			
Aq. dest., }	āā ℥ss;	15	
Glycerin.,	℥jss;	45	
Sulphur. sublim. [vel. sod. }	℥ss;	2	
sulpho-ichthyol.], }			
Coque.			

A mixture of dextrin and lead is thus prepared:

℞ Lithargyr.,	℥j;	30	
Acet.,	℥jss;	45	
Coque ad remanent., 50.			
Adde:			
Dextrin., }			
Aq. dest., }	āā ℥ss;	15	
Glycerin., }			
Coque.			

If too consistent, these pastes are made to spread easily by the addition of a few drops of hot water.

For gum-pastes, gum Arabic is used in the proportion of 1 part of the mucilage and glycerin to 2 parts of the powder selected, mixed without heat—*e. g.*:

℞ Zinc. oxid.,	℥jss;	45	
Hydrarg oxid. rub.,	℥ss;	2	
Mucilag. acac., }	āā ℥ss;	15	
Glycerin., }			M.
℞ Cret. præparat., }			
Sulphur. sublim., }	āā ℥ss;	2	
Picis liquid.,	℥ij;	8	
Amyli,	℥ss;	15	
Mucilag. acac., }	āā ℥ss;	15	
Glycerin., }			M.
℞ Acid. salicylic.,	℥ss;	15	
Glycerin.,	℥ss;	15	
Mucilag. acac.,	℥j;	30	
Ol. ricini,	℥ijss;	10	M.

The following details are to be noted respecting the availability of these pastes for different ingredients: Lead is best used as an acetate, either in a simple paste or with dextrin, the carbonate, oleate, and iodide combining well with both. Zinc oxide and sulphur combine well with kaolin, lead, starch, dextrin, and gum. Sulphur combines well with the three last named, poorly with kaolin, and not at all with lead. Ichthyol suits well with all save the gum-pastes. Naphthol, calomel, corrosive sublimate, red and white precipitates, carbolic acid, chloral hydrate, camphor, and salicylic acid can be incorporated with all, the last named in smaller proportion with gum-paste. Tar is better united with starch, dextrin, and gum than with the others. Iodine and iodoform naturally do not suit well with the starch- and dextrin-pastes. Chrysarobin and pyrogallol are united with kaolin and gum-pastes, and should not be added to them. Fatty and soapy

substances, if commingled in large amounts with these pastes, injure their special properties.

Glycogelatins are useful for protecting a surface and excluding the air. They are made with varying proportions of glycerin, gelatin, zinc oxide, and water. When cold they are solid, but when melted on a water-bath can be painted readily over a surface, upon which on cooling they form an adherent protective coating. Before the gelatin has hardened on the skin it is well to pat it with cotton, or to lay over it a piece of thin gauze or muslin to form an additional protection and to prevent the paste sticking to the clothing. A firm but soft and flexible gelatin is made by mixing on a hot-water bath 1 part of zinc oxide, 2 of gelatin, 3 of glycerin, and 4 of water. More gelatin in the preparation makes it firmer and causes it to dry quicker. A greater proportion of glycerin, on the other hand, interferes with the complete drying of the surface, but makes a softer preparation, more acceptable to some skins and very useful where a bandage can be applied. Zinc oxide helps give body to the gelatin, but if used in too large proportion interferes with the coherence of the preparation, so that it cracks when dry. To the glycogelatins may be added white precipitate, sulphur, ichthyol, thiol, chrysarobin, iodoform, or other antiseptics. Some drugs, as salicylic acid, resorcin, naphthol, and carbolic acid, tend to destroy the coherence of the gelatin. Fox says that this obstacle may be removed by adding to the paste 5 or 10 per cent. of fresh lard.

Varnishes, containing glycerin and a single gum, are often very serviceable in protecting the skin. They are especially useful on the face, as they are transparent and inconspicuous.

Pick's varnish (*linimentum exsiccans*) is made as follows:

℞ Tragacanth,	5 parts.
Glycerin,	2 parts.
Distilled water,	93 parts.

The tragacanth is soaked in a portion of water from ten to twelve hours and triturated to a perfectly smooth mass before adding the glycerin and other ingredients ordered. The jelly may be prepared without delay by triturating the tragacanth with boiling water, but the result is not so good.

This jelly is applied without heating and quickly dries on the skin. An improvement on this varnish is Elliott's bassorin paste, which keeps better than the former. The formula is as follows:

℞ Bassorin,	3jss;	45
Dextrin.,	3vj;	24
Glycerin.,	3iiss;	10
Water to make	3iij;	90

This should be kept in a tightly closed jar, as it dries rapidly on exposure to the air. Like the other pastes, it not only serves as a protective coating, but also as a base for the application of other remedies.

Powders are mechanically dusted over the surface of the skin for the purpose of protecting it, and occasionally, also, to produce an astringent or antipruritic effect. To be serviceable, they should generally be rendered impalpable by sifting them carefully through a fine silk bolting-cloth. They are composed of starch, talc, magnesia, lycopodium, calamine, bismuth, boric acid, the several stearates, camphor, tannin, zinc oxide, iodoform, rice, kaolin, magnesium silicate, orris root, salicylic acid, aristol, euophen, and similar substances. The articles sold by grocers as "gloss starch" and "corn-starch farina" are usually much more finely bolted than the dusting-powders extemporaneously prepared by chemists. All starchy substances are open to the objection of forming little pasty rolls or "cakes" when wetted with serum or with sweat. Lycopodium, which consists of irregularly shaped globular pollen-sporules, never behaves in this way, and is, for that reason, deservedly popular. Zinc-stearate with acetanilid is excellent for similar reasons, and when dusted on the surface forms a dressing impervious to moisture.

Medicated powders may be first dissolved in alcohol, ether, or chloroform. The solution is then mixed with starch or with French chalk. Evaporation of the menstruum is conducted without artificial heat, and a fine starch or chalk-powder results.

For absorbent purposes Grundler¹ has shown that by far the most effective powder is magnesium carbonate.

Plasters are employed when it is desired to exert a more or less continuous effect upon the skin, and are thus necessarily consistent and desirable. The resin-plasters are less useful in skin diseases because more irritating than the lead-plasters. In the zinc-oxide adhesive plaster the irritating effects of the resin have been entirely overcome, and the result is a plaster which has excellent adhesive qualities and which rarely causes irritation even to sensitive skins. It thus answers admirably where simple protection is desired, and may be safely employed in order to retain other dressings in place. Unna's plaster-mulls are described below. The mercurial plasters are useful especially in syphilitic lesions of the skin.

A valuable addition to the list of methods for applying medicated ointments to the skin has been devised by Unna. His *Salve-muslins*, or salve-mulls, are strips or bandages of muslin thoroughly impregnated and thickly spread with ointments medicated with almost every desirable substance, from zinc-oxide to tar, thymol, salicylic acid, and mercury. They are elegantly made, and when exported are surrounded by impermeable tissue, so that they remain fresh and sweet for several weeks, or even for months if kept in a cool place, but deteriorate rapidly if exposed to the air of a warm room. They are efficacious, and, as a rule, well liked by patients. They are available in skin diseases of the exudative class affecting the extremities, but should be avoided when not recently prepared.

Unna's *Plaster-mulls* seem to be less useful. They are plasters

¹ Monatshefte, 1888, vii., p. 1029.

thinly spread on gutta-percha cloth, and manufactured with a wide range of medicinal constituents. They serve a good purpose in the protection of parts of the skin exposed to friction.

Salve-pencils (*Stili unguentes*) and **Paste-pencils** (*stili dilubiles*), the latter destitute of fat and soluble when moist, the former insoluble in water and compounded of fatty substances, are pencil-sized crayons made with wax, gum, and starch, for application to limited areas of the skin. The several mercurials, arsenous acid, cocaine, salicylic acid, and other medicaments may be applied in this way to the surface.

Poultices.—These are not often ordered in the management of diseases of the skin, except for the purpose of softening crusts with a view to their removal. They are made, both warm and cold, with linseed-meal, potato-starch, bread and milk, oatmeal, and cornmeal. These applications are objectionable in all conditions in which a macerative effect of the epidermis is produced; and also in which micro-organisms may find a culture-field in the mass of the poultice. Poultices, in any needful case, may be made antiseptic by the addition of formalin, boric acid, or mercuric chloride.

Lanolin, or wool-fat, was first introduced as a salve-base by Liebreich, of Berlin. It is a substance obtained from keratinic tissues, and contains cholesterin-fat instead of glycerin, with but 30 per cent. of water. It has a bright-yellowish color, a distinct odor of the sheep, and is neutral; when pure it is never acid in reaction. The refined product is free from cholesterin compounds and requires no fatty addition. This substance is readily absorbed from the surface of the skin, and, either pure or medicated, may be regarded as a useful addition to the bases of ointments. The adeps lanæ answers the same end.

Oleates.—The oleates of zinc, mercury, copper, lead, and other metals have been employed with advantage in the topical treatment of disorders of the skin. Of these, the oleates of mercury and of lead are decidedly the most valuable. The latter is represented by Hebra's white diachylon ointment. The mercuric oleate is serviceable in syphilitic, parasitic, and other disorders.

Vasogen.—These products bid fair to supplant the oleates in their ready absorption from the skin-surface. In mercurial inunction vasogen-mercury capsules supply the exact amount required for employment at each sitting.

Collodion and Traumaticin are employed for the purpose of applying a remedy to the skin, and at the same time for protecting or contracting the surface to which the application is made. Traumaticin is the name given to a solution of gutta-percha in chloroform, in the proportion of 10 per cent. In this way bismuth, cantharides, sulphur, chrysarobin, zinc oxide, white precipitate, iodine, and other substances may with advantage be applied to the surface, and the action of each be definitely limited to the margins of a single patch of disease.

Tar.—Tar in its several varieties, crude and distilled, together with its derivatives, occupies an important place among efficient topical agents. In general, it seems to exert upon the epidermis a local influence, which extends more deeply as the remedy is continuously applied. At times both irritative and inflammatory effects are thus induced, and even systemic intoxication when absorption from the skin occurs. *Pix liquida*, or the *oleum picis*, is the favorite article of this group with most American physicians; but the *oleum cadini*, or oil of juniper, and the *oleum rusci*, or oil of birch, are rather more generally employed by experts. The last-named, found in purity and abundance and to be had at a low price, is recommended above the others. In Vienna the distilled oil is preferred, but there is good reason to believe that the crude oil is more efficacious.

The skill of a physician intrusted with the management of a disease of the skin might almost be measured by his success in the use of tar. He who has not had experience in its employment is urgently advised to select one member of the tar-family and learn thoroughly how to apply that, singly and in combination, either as a lotion or in salve. Properly employed, it will favor involution of lesions, lessening hyperæmia, infiltration, scaling, and discharge. It serves admirably as an antipruritic. It may, however, produce severe inflammation of the skin.

To produce the benign or emollient effects of tar, it is best mixed with some soothing or astringent powder, and with this end in view nothing is better than chalk. Spender's hints¹ for making such an ointment are admirable: Finely levigated chalk is strewed into melted lard in a stone jar, the whole being stirred until it is cold. Then at first the smallest quantity of tar sufficient to make a brownish smear of color is added to the quantity of salve employed for use. This color can be successively deepened at will. Auspitz advises the use of the tars in a pure state, applied in very small quantities with a strong bristle-brush and well rubbed in. In combination with one of the most valuable of all substances for topical use in cutaneous therapeutics, viz., sulphur, tar enjoys a special reputation. The Wilkinson salve modified (*q. v.*) represents such a combination.

A group of substances which occupy a therapeutic position inferior to the tars, but which serve an important end in the management of cutaneous diseases by the production of similar effects, are carbolic acid, creosote, salicylic acid, benzol, naphthol, iodol, thiol, chrysarobin, pyrogallol, resorcin, and jequirity.

Ichthyol, fish-oil, introduced to the profession by Unna, is the distillate of a bituminous and sulphurous deposit of petrified fishes and marine fossils found in the Tyrol. Its chemical formula is $C_{26}H_{36}S_3Na_2O_6$. It has a tarry appearance, odor, and consistency. It is soluble in water, partly so in ether and alcohol, and can be incorporated in any desired proportion with fat, vaselin, and lanolin. It has been used both pure and diluted; and several proprietary

¹ Practitioner, June, 1883, p. 402.

articles (plasters, soaps, salves, and medicated cotton) are in the market. It has been used both in America and in Europe in cases of leprosy, pruritus, acne, syphilis, eczema, psoriasis, and a number of other cutaneous disorders.¹ It is used in solutions of from 10 to 50 per cent. and in salves of from 5 to 20 per cent. strength. As before stated, it is also administered internally, more particularly in the management of rheumatism, in doses of from 15 to 20 drops. It does not seem to have a disturbing effect upon the stomach.

Unpleasant results have been reported as following its application in a single instance (Sinclair). A four months' old infant sank into a stupor two hours after its head and limbs were smeared with a salve composed of one part of ichthyol to five of vaselin.

Thiol makes an excellent substitute for ichthyol for most purposes, and lacks the unpleasant odor of the latter.

Resorcin in ointments of the strength of from 5 to 20 per cent. serves as an antipruritic and alterative. Stelwagon reports an anodyne effect following its use. The same experimenter has modified Ihle's formula by adding 1 drachm (4.) of resorcin to 1 to 2 drachms (4.-8.) of castor-oil, 5 minims (0.33) of Peruvian balsam, and 4 ounces (120.) of alcohol, for use in alopecia and seborrhœa of the scalp. It is a valuable parasiticide in lotions of the strength of from 5 to 10 per cent., and is especially useful in disorders of the scalp due to seborrhœa.

Naphtol, or β -naphtol, as it is termed chemically, first introduced by Kaposi, is chiefly valuable in scabies, but has also been used in the management of eczema, psoriasis, and other exudative affections. Van Harlingen² has found it to answer well in seborrhœa of the scalp. Neisser has described renal disorders as resulting from its use in children, but MM. Josias and Nocard³ report that in ordinary medicinal doses it is harmless. The fact that the naphtol preparations are odorless and do not stain the skin is to be set down in their favor.

Naftalan.—This is a distillation product from crude nafta that is found in the Caucasus. It is a thick fluid of dark green color and contains two and a half to four per cent. of soap. It may be mixed with powders, thus producing an ointment of any consistency. It is advised in inflammations of the skin accompanied by moisture.

Boric Acid is of great value in diseases of the skin and is extensively employed as a lotion and in ointments and powders. As a rule, it exercises a sedative effect upon the surface to which it is applied. Over mucous surfaces it is occasionally a source of moderate irritation.

Salicylic Acid operates especially upon the keratinized tissues of the epidermis, softening and separating the external portions of the horny layer from its deeper connections. For this reason it has a

¹ See Baumann and Schöten, Monatshefte, 1883, ii., p. 257; Unna, Ibid., 1882, i., p. 225; Deut. med. Zeit., 1883, iv., p. 217; Samml. klin. Vort., 1885, No. 252; Lorenz, Deut. med. Wehnschrft., 1885, xi., p. 627; Stelwagon, Jour. Cutan. Dis., iv., p. 326; Zeisler, Chicago Med. Jour. and Exam., 1886, liii., p. 32.

² Amer. Jour. Med. Sci., 1883, n. s., lxxxvi., p. 479.

³ Annales, 1885, s. ii., vi., p. 257.

special value in all the hyperkeratotic dermatoses. In somewhat weak strength it is employed as an antipruritic agent. It is most often employed in salves or pastes but is also used in lotions, being soluble in 2.5 parts of alcohol, 2 parts of ether, or 450 parts of water. It is a common ingredient of most of the popular corn- and wart-cures.

Carbolic Acid, since in value as an antiseptic it has been largely surpassed by other articles, is chiefly employed to-day upon the skin as an antipruritic. It is applied in the form of lotion, salve, and paste, but much more often in lotions having the strength of from 10 to 20 grains to the ounce (0.66–1.33 ad 32.). Other acids—nitric, sulphuric, lactic, acetic, muriatic, benzoic, tannic, chromic—are employed either for caustic, destructive, or stimulating effect, usually in liquid form. Tannic acid, however, is occasionally employed as a powder, in which form its astringent quality is combined with the soothing or antiseptic effect of other substances in powder.

Chrysarobin, Pyrogallol, and Anthrarobin are useful as cutaneous stimulants capable of determining in the skin to which they are applied a characteristic dermatitis limited to the site of the application. Chrysarobin is especially useful in the local treatment of psoriasis, lepra, and the disorders due to vegetable parasites. It is employed in from 1 to 10 per cent. strength, in salve, lotion, or in collodion or traumaticin. A useful combination in the parasitic disorders of the scalp due to the microsporon Audouini or to the trichophytons, is a solution of chrysarobin in oil of turpentine, about 1 part in 250. A chief objection to its use is the consequent staining of the skin and articles of apparel. On the scalp the hairs are turned to a yellowish-green shade. Pyrogallol oxidizes after exposure and turns the skin a blackish color. It is useful in many cases of lichen planus, eczema, and the diseases due to the vegetable parasites. It has been employed in the strength of 50 per cent. in the removal of epitheliomata. Anthrarobin, though inferior to both of the other articles named, is effective in the same general manner.

Iodine, especially in the form of tincture, is useful as a local application in certain of the seborrhœas, and as a parasiticide. It is often employed with mercury in the form of an ointment. The ointments compounded of the salts of iodine with mercury, though of unquestioned efficacy, are less employed to-day than formerly.

Jequirity (*Abrus precatorius*), employed by ophthalmologists for the purpose of inducing artificial inflammation of the conjunctiva, has been used by Shoemaker¹ in the management of lupoid and other ulcers. One part of the cleansed, decorticated, and bruised grains, macerated for twenty-four hours, and reduced by rubbing in a mortar to a smooth paste, was added to sufficient water to make four parts. This emulsion was used for local application.

Sulphur, popularly employed chiefly as a laxative or for the local treatment of scabies, has also a deserved reputation in cutaneous therapeutics as an external agent in a wide range of non-parasitic

¹ Lancet, 1884, ii., p. 185.

disorders. Hebra once regarded it as valueless in eczema, but his opinions on this point are not now generally accepted. It is a remedy of great merit in all seborrhœic conditions. Precipitated sulphur is to be preferred to the other compounds of the pharmacopœia. It may mechanically be incorporated with salve-bases, or chemically combined with vaselin and other petroleum-products, a process by which, as experiments have shown, its therapeutic value is not increased. It is also applied after mechanical union with various substances as a lotion. It is irritating to the acutely inflamed skin, but is much better tolerated than the tars in conditions of subacute or chronic exudation.

Formaldehyd is a valuable antiseptic agent most commonly employed as formalin, a proprietary preparation representing 40 per cent. of the compound. Formalin in the strength of 1 per cent. commonly produces a slight irritation over the thin skin of the face; and after application in the strength of 2 per cent., which should be rarely exceeded on the cutaneous surface, there follows a decided sensation of burning with a resulting transient erythema. It is a remedy of the highest value in the treatment of syphilodermata, acne, seborrhœa, the disorders produced by the vegetable parasites, several of the eczemas, impetigo, and other affections. It is well to color the solution with a trace of fuchsin.

Pyoktanin-blue is employed in aqueous saturated solution as a parasiticide in those disorders of the skin especially which affect regions beneath the clothing or which may be protected by dressings from exposure to the eye. It is highly valuable as a local and painless application in circumscribed patches of weeping or scaly eczema, in many of the ulcerating syphilodermata, in lupus, and in ringworm. It should be applied daily in several coats, each coat being permitted to dry before the next is superimposed.

Potassium Permanganate belongs to the same category as pyoktanin-blue, with the disadvantage that in some strengths it is productive of pain, while the pyoktanin solution is unproductive of pain. From 2 to 10 per cent. solutions of the potassic salt may be painted on the affected surface one or more times daily till the desired effect is produced. The indications for its use are those which the pyoktanin solution is intended to meet.

Mercury and its compounds are of value in the local treatment of many disorders of the skin, syphilitic and non-syphilitic. The preparations of mercury employed as topical agents in the treatment of diseases of the skin are of the highest value. They include corrosive sublimate, calomel, the red and yellow oxides, the biniodide and cinnabar, the white and red precipitates, and the nitrate. The most commonly employed of their combinations are the "black wash," ointment of the nitrate, and mercurial ointment. Fumigation of the surface by vaporization of either cinnabar or calomel or the two in combination is chiefly employed in the local treatment of syphilodermata. The bichloride is most often applied as a lotion; calomel and white precipitate in ointments; though calomel is often effec-

tively combined with talc or starch as a powder. Startin's nitric oxid of mercury ointment represents a combination of two mercurials: red mercuric oxide, 6 grains (0.40); mercury bisulphate, 4 grains (0.25); simple cerate, 1 ounce (32.). Corrosive sublimate as a parasiticide is of great importance in the treatment of several cutaneous disorders due to the presence of micro-organisms, as, for example, lupus vulgaris.

Chloral-camphor and Phenol-camphor have value chiefly as antipruritics. The former is obtained by rubbing together chloral hydrate and gum-camphor (Bulkley) until they form a clear liquid of pungent odor. Phenol-camphor is made by gradually adding camphor to melted crystals of carbolic acid, a colorless liquid resulting having the fragrant odor of camphor without that of the acid. It is a useful local anæsthetic agent, being insoluble in water, but freely soluble in chloroform, ether, and alcohol.

Many Agents are employed upon the surface of the integument to produce in various degrees a *caustic* or *destructive* effect. Among these may be named the thermo-cautery (Paquelin-knife), galvanocaustic apparatus, the mineral acids and alkalies, sodium ethylate, arsenic, zinc-chloride, several mercurial compounds, mercuric nitrate, mercuric chloride, antimonious chloride, cupric sulphate, and argentic nitrate. Several of these substances in weak solution are employed as milder agents for the production of irritative or even inflammatory effects. To the latter class should be added iodine in tincture, chloroform, tartar emetic, croton-oil, and cantharides. These destructive effects are of advantage in the treatment of disorders of the integument due to parasites, either animal or vegetable. Of those employed for this purpose, and not mentioned above, may be named petroleum and staphysagria, for the destruction of lice; sulphur, styrax, and balsam of Peru, for the destruction of acari; and sulphur and its compounds and a number of derivatives from tar, for the destruction of vegetable parasites.

Counter-irritation over the Vasomotor Centres, as recommended by Crocker, is an efficient means of relieving fixed and obstinate cutaneous disorders. It may be produced by the action of sinapisms, blisters, or caustics over the region selected for such irritation.

Hyperæmic Treatment—Biers.¹—This method of treatment finds some application in cutaneous diseases. Both passive or venous and active or arterial hyperæmia may be used here as well as in other branches of medicine and surgery. Passive hyperæmia may be induced by an elastic bandage or by means of cupping. Active hyperæmia is induced by hot air. By one or the other of the methods, such diseases as eczema, psoriasis, sycosis, keloid, alopecia areata, lupus vulgaris, and staphylococcus infections may be benefited.

A large list of medicinal substances might be added which are occasionally employed in cutaneous affections, some very rarely, the

¹ Biers' Hyperæmic Treatment, 1908; Willy Meyer and Victor Schwieden.

most with questionable effect. Among them may be named alcohol, which is of high value as a disinfectant, and hydrogen peroxide, having a similar effect; ether, the opium alkaloids, cocaïne, belladonna, cannabis indica, and aconite, for anæsthetic and antipruritic effect; and ergot, cantharides, mustard, croton-oil, tartar emetic, benzoin, capsicum, rosemary, and the several salts of lead. Many of the articles named, such as cantharides, rosemary, and capsicum, are employed as lotions for the scalp in the several alopecias.

The salts of zinc (sulphate, sulphocarbolate, acetate, oxide), of copper, alum, lead, bismuth, and other metals are of service in diseases of the skin as productive of both astringent and stimulating or even of caustic effects. The careful adjustment of the dosage in each instance is of the highest importance, and is practically indispensable for the production of beneficial effects.

Electrolysis is a method of the greatest value in the treatment of a large number of cutaneous affections, such as hypertrichosis, telangiectases, molluscous tumors, warts, etc. It is accomplished by the aid of the galvanic battery in the manner described in this work in the pages devoted to the first of the disorders named.

The Minor and other Surgical Operations required in the management of some affections of the skin are detailed in the treatises devoted to that subject. Among such procedures may be named skin-grafting, both by the methods of Reverdin and Thiersch, and the several devices of plastic surgery. Strictly dermatological procedures to which resort must often be made are: epilation in hyphogenous sycosis and other affections; massage, especially by the massering-ball; the operations on the face, especially in acne, when opening small abscesses, removing comedones, and incising papules; and multiple scarification, as in telangiectases and other lesions.

Numerous surgical and other appliances are found useful as adjuvants in the treatment of skin diseases. They may be employed to support, protect, or compress the surface, or merely to aid in the retention of dressings or external medicaments. Thus, the ordinary roller-bandage is applicable to many portions of the body; the suspender, or suspensory bag, to the scrotum; elastic or inelastic stockings to the feet and legs; kid, rubber, and thread gloves to the feet and fingers; and various skull-caps, face-masks, and mittens are employed in the case of infants and children to protect affected surfaces from the traumatisms of scratching.

Apart from the surgical apparatus required for ablation of tumors or severe operations, a number of instruments are required for the daily use of the dermatologist. Among these may be named:

A set of variously sized dermal curettes. These sharp-edged spoons are for erosion of the surface, and should, for general use, have in each a fenestrum large enough to permit the escape from the floor of the spoon of all collected substances. The small-sized spoons,

however, with solid bowl and sharp edges, largely used in Vienna, are preferable for use, especially about the face, in many skin-affections. Epilating-forceps, with easy springs and smooth blades meeting in perfect apposition; a set of Piffard's comedone-extractors, provided at each extremity with a differently sized, minute, spoon-shaped and perforated bowl, the convex surface of which is pressed over the comedo with the orifice immediately over the black head of the plug. This is a great improvement over the old-fashioned comedo-extractor shaped like a watch-key, and the discomfort to the patient by its use is greatly reduced. A set of half-inch and four-inch lenses for examining the surface of the skin; needle-holders with light handles for firmly grasping the needles used in opening pustules, etc. The needles, some of them, should be flat, with a double-cutting edge, others should be rounded neatly on an emery-wheel, and all of them carefully disinfected. Too many precautions cannot be taken in the practice of dermatology with respect to the disinfection of all instruments made to penetrate the skin. Probes, exploring-needles, fine dressing-forceps, delicate straight and curved scissors, and other instruments from the ordinary pocket-case of the surgeon, are indispensable. The instruments required for use in connection with the galvanic battery are enumerated in the chapter on Hypertrichosis.

FIG. 22.



Irido-platinum needle.

FIG. 23.



Millium-needle.

FIG. 24.



Scarifying-spud.

FIG. 25.



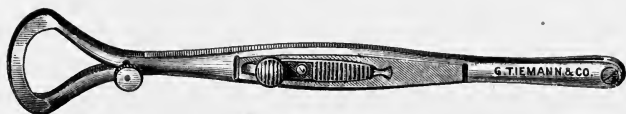
Epilating-forceps.

FIG. 26.



Piffard's grappling-forceps.

FIG. 27.



Piffard's cutisector.

FIG. 28.



FIG. 29.



Dermal curettes.

FIG. 30.



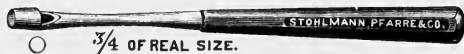
Hess's pleximeter, for observing the skin under pressure.

FIG. 31.



Piffard's modification of Unna's comedo-extractor.

FIG. 32.



Keyes's cutaneous punch.

FIG. 33.



Hyde's massering-ball.

Radiotherapy¹ (Treatment by X-rays) has an established position as a therapeutic agent in cutaneous medicine. Among the diseases in the management of which it has distinct value are epithelioma, lupus

¹For complete presentation of the subject and bibliography, see: Freund, *Grundriss der gesamten Radiotherapie*, Berlin and Vienna, 1903; Williams, *The Röntgen Rays in Medicine and Surgery*, New York, 1901; Pusey-Caldwell, *The Röntgen Rays in Therapeutics and Diagnosis*, Philadelphia, 1903; Stelwagon, *Jour. Cutan. Dis.*, 1903, xxi., p. 345 (with discussion before the Amer. Derm. Soc.); Pusey, *Ibid.*, p. 355 (with discussion before the Amer. Derm. Soc.); Bronson, *Ibid.*, p. 375. For recent papers on radio-therapy see *Transactions of the Sixth International Dermatological Congress*, 1908.

vulgaris and other forms of cutaneous tuberculosis, coccogenous and hyphogenous sycosis, acne vulgaris, rosacea, psoriasis, hypertrichosis, lupus erythematosus, ringworm, and favus. The list includes diverse morbid conditions, but these in turn actually are remedied in many cases by one or the other of the therapeutic properties of the agent. X-rays *per se* are not germicidal, but indirectly, through tissue-reaction, they may produce such effects in a high degree, as shown by the partial or complete arrest of purulent discharge from the surface of carcinomatous or other ulcers subjected to their action. They produce degeneration in cells of embryonic type without destroying the healthy stroma in which they have developed; cells also of higher differentiation are affected early. As a consequence, hair-follicles and sebaceous glands may become partially or wholly atrophied under the influence of the ray, the result depending upon its quantitative value.

Clinical Effects of the rays upon normal skin vary from slight erythema and pigmentation to deep-seated, destructive inflammation. The earliest evidence manifested is either pigmentation or erythema. The former may be lentiginous or exhibited as a diffuse, brownish discoloration of different shades, the amount of pigment varying as a rule with the complexion of the patient. Usually this disappears within a few days or weeks, though it may persist for several months. Erythema appears early and soon subsides, with superficial desquamation and pigmentation, if treatment be suspended in time. The process usually lasts from a few days to two weeks, and is accompanied by mild itching or pricking sensations. Should the inflammatory process progress to a further stage, vesicles appear on the erythematous area. These may be either superficial and short-lived, soon drying and disappearing, or more deeply situated, and associated with greater swelling and increased redness, the whole area becoming denuded of its superficial epithelium and showing an excoriated and weeping surface (*x-ray dermatitis*). This surface usually becomes covered with a yellowish or grayish adherent pellicle, composed of necrotic epithelium, which gradually retracts, its place being taken by normal cornified cells. In case the pellicle does not form, bluish islands of epithelium appear over the weeping surface, which by enlargement and coalescence cover the area. The new epithelium is smooth, delicate, bluish-white in color, devoid of pigment and hair, and may remain sensitive to external influences for some time. The duration of this degree of dermatitis is from a few weeks to several months, and the subjective sensations vary; usually a burning, tingling, or itching sensation is experienced, with occasionally marked tenderness and some pain. In a dermatitis of serious portent, the subcutaneous and deeper tissue is involved. The inflammation begins with erythema, vesiculation, and marked swelling; the skin becomes cyanotic and brawny, and necrosis follows. The affected area is covered with a dry, dark-colored, leathery, adherent mass of tissue, which may persist for months, is surrounded by a reddish inflammatory

border and is accompanied by severe pain. These lesions are chronic, lasting for months or years, and the cicatrix which eventually forms may be covered with telangiectases. Fortunately, these severe burns are now of rare occurrence. The majority of recorded cases occurred after long exposures for skiagraphic purposes.

A chronic form of dermatitis occurs on the hands and sometimes on the face of *x*-ray operators, which is attended by scaling, atrophy, obliteration of the normal lines of the skin, telangiectases, alopecia, and at times loss of the nails. Ulcers and hyperkeratoses, some of which developed later into epithelioma, have occurred, and occasionally a condition simulating scleroderma has been noted.¹

Of great importance in estimating probable results are the facts that the reaction of the skin exposed to the *x*-rays occurs only after a period of delay, which may be prolonged for three weeks or more, and that the effects are cumulative.

Pathological Action of *x*-rays has been studied both on man and in animals by several observers. Schlotz² concludes that: First, the rays cause a slow degeneration of the elements of the skin, in which the cells, not only of the epidermis and its appendages, but also those of the corium, may participate. This degeneration affects the nucleus as well as the protoplasm of the cell. The rays also induce, but to a much less extent, a degeneration of the fibrous elements (collagen, elastin), and of the muscles. Second, when the cellular degeneration reaches a certain point an inflammatory reaction occurs, in which the blood-vessels become dilated and an extravasation of serum and leukocytes results. The latter then seem to act as phagocytes and to destroy completely the degenerated cells. MacLeod³ adds that "the inflammatory reaction induced by *x*-rays is peculiar in that it occurs in a tissue the vitality of whose various elements has already been impaired by the action of the rays, and in that it is associated with greater destructive changes than those produced by actinic rays, and is apt to lead to ulceration and necrosis, and is liable to be followed by an imperfect process of repair." An agent having such properties is obviously of great value, but not without danger in its application.⁴

Apparatus (X-ray).—Two forms of apparatus are in common use, one employing an induction-coil, the other a static machine. An electric current or storage batteries are essential when a coil is selected. Either apparatus will accomplish the desired end when properly managed. The popular idea that the static machine should be used for therapeutic purposes on account of its greater safety, is erroneous, as serious damage has been wrought by its use. A coil having a double or a triple winding in the primary, which may be connected in parallel or in series, is efficient. It should furnish a

¹ Jour. Cutan. Dis., 1903, xxi, p. 52.

² Archiv, 1902, lix, pp. 87 and 241 (abstr. in Brit. Jour. Derm., 1902, xix, p. 397).

³ Brit. Jour. Derm., 1903, xv, p. 365 (with review of literature on pathological action of *x*-rays).

⁴ The treatment of *x*-ray dermatitis is considered with other forms of dermatitis.

spark-gap of the length of 30 cm. Four varieties of interrupters are used: the turbine and the dip interrupters, in both of which mercury is used; the Wehnelt (or electrolytic), and the vibratory interrupter; each of the four possesses some advantage peculiar to itself. A voltmeter, ammeter, and tachometer indicate, respectively, voltage, ampèreage, and frequency of interruptions. Lead plate, as a rule, is interposed between the tube and the skin in the vicinity of any lesion to be treated. The lead is placed between the tube and the patient, and should have an aperture of the size or slightly larger than the lesion to be treated through which the rays pass. Röntgen found that lead one-sixteenth of an inch thick was impervious to all rays. Practically, however, one-thirty-second of an inch is sufficiently thick. Aluminum screens, advised by Thompson,¹ may be interposed, when treating deeper lesions, to intercept some of the rays which are absorbed superficially and which induce early dermatitis. The elimination of these rays allows the treatment to be pursued for a longer period without damage to the superficial tissues.

Technique.—A reasonably safe technique was early devised by Schiff and Freund, as follows: The coil should furnish a spark-gap of 30 cm. A primary current of 12 volts and $1\frac{1}{2}$ ampères is advised, with interruptions of 600 to 1000 per minute. The tube should be placed 15 cm. distant from the surface treated, gradually reducing the distance to 5 cm. The time of treatment in the beginning should be five, this to be increased gradually to fifteen, minutes. Three preliminary exposures of five minutes each, given daily, with the tube at a distance of 15 cm., are first to be employed. If, after an interval of three weeks, no unusual reaction occurs, treatment is resumed and pursued. As there are no means of measuring exactly the quantity of radiation from a given tube, and as the reaction in each individual case must be the chief guide, a perfect technique cannot be outlined. (For details as to duration and number of exposures, distance of the tube, etc., consult the chapters devoted to the diseases in which this treatment is recommended.) Preliminary exposures with a view to testing the susceptibility of the patient should never be neglected, especially in the treatment of such disorders as acne and hypertrichosis. The difference in susceptibility of different patients to the rays is not only demonstrable, but in certain cases, amounts to a dangerous idiosyncrasy.

Tubes.—The greatest problem in radiotherapy is furnished by the tube. Successful treatment depends much on the ability of the operator to recognize, to a degree at least, the condition of the tube employed. Tubes are designated as "hard" or "soft." A hard tube is one in which, the vacuum being more perfect, there is a marked resistance to the passage of the electric current; its rays have penetrating qualities, contain fewer of the rays absorbed superficially, and consequently affect the skin only after a number of exposures. A soft tube has the reverse effect. Its vacuum is relatively low; it

¹ Boston Med. and Surg. Jour., 1896, cxxxv., p. 610.

offers but little resistance to the passage of the electric current; the rays produced in it are largely absorbed by the superficial tissues; and it readily produces dermatitis. The shadow-picture on the fluoroscopic screen produced by *x*-rays from a hard tube shows but little contrast between the flesh and bones of the hand; while with a soft tube the contrast, for obvious reasons, is conspicuous. A newer tube emits more *x*-rays than an older tube. Tubes become hard by use, and if not fitted with a regulating device, become inefficient. Rest softens a hard tube to some extent. The focus of the cathode rays need not be small for therapeutic work; for fluoroscopy and skiagraphy this is essential. A tube having a regulating device of some sort is preferable, as it can be softened at will.

It follows that in the treatment of superficial cutaneous diseases soft, or moderately soft, tubes are preferable, even though they may produce dermatitis if used sufficiently. It is this quality that gives them their efficiency. With such tubes a large amount of treatment is never necessary, and the reaction should be anticipated by suspending treatment before its appearance. By careful regulation of the other factors, such as the intensity of the light, etc., best results may be obtained. In epithelioma usually a moderately hard tube is advisable, the quality depending largely on the depth of the lesion and the quantity of rays usually necessary for its removal. Other elements equal, the intensity of the rays varies directly with the strength of the primary current (Röntgen), and the effect varies inversely as the square of the distance of the tube from the surface exposed. In epithelioma radiotherapy possesses the advantage of being a painless method of treatment. As pathological cells are affected and destroyed with a smaller amount of *x*-rays than normal cells or normal connective tissue, it follows that good cosmetic results may be obtained when the quantity of rays applied is sufficient to destroy the diseased cells without injury to other structures.

Phototherapy.—Since 1896, when Finsen published his first report on the treatment of lupus vulgaris with concentrated chemical rays of light, the therapeutic value of light has been studied both clinically and experimentally in the laboratory by many observers, and the literature of the subject has become extensive.¹

The bactericidal properties of light were demonstrated first by Downes and Blunt in 1877, and since then by many other observers. The fact is now well established that the chemical rays of light, if concentrated and their action sufficiently prolonged, are capable of destroying the majority of pathogenic bacteria, though the resisting power of different micro-organisms differs considerably. The ex-

¹ For bibliography, see Mittheilungen aus Finsen's Lysinstitut, Nos. 1-4 (German translations, Leipzig and Jena, 1900-4); Leredde et Pautrier, *Annales*, 1902, 3 s., iii., p. 341, and *Photothérapie et Photobiologie* (monograph of 267 pp.), Paris, 1903; Freund, *Grundriss der Gesamten Radiotherapie* (monograph of 423 pp.), Berlin and Vienna, 1903; Möller, *Bibliotheca medica*, Abt. D 11 (monograph of 142 pp.); Hyde, Montgomery and Ormsby, *Jour. Amer. Med. Assoc.*, 1903, xl., p. 1; and Montgomery, *Jour. Cutan. Dis.*, 1903, xxi., p. 529.

periments of Finsen, Bang, Bie, Freund, Stroebel, Busch, Jansen, and others have demonstrated: (1) That of all parts of the spectrum the ultra-violet rays are the most highly bactericidal, and are also most stimulating to plant and animal cells, these properties gradually diminishing in power toward the red end of the spectrum, where they are comparatively slight. (2) The power to penetrate tissue is greatest at a certain point in the ultra-red part of the spectrum, and diminishes in both directions, the ultra-violet rays being absorbed for the most part by a thin layer of glass or by the uppermost layer of the epidermis, and unable to penetrate the skin more than a millimeter. (3) The effective rays in the treatment of skin diseases are, therefore, the visible blue and violet, and the immediately adjacent ultra-violet rays, since these are both bactericidal and stimulating to cells and have some power of penetration. Jansen has shown that by prolonged action (seventy-five minutes) of the light as employed at the Finsen Institute in Copenhagen, bacteria may be destroyed, in tissue exsanguinated by pressure, at a depth of 1.5 mm., and their growth retarded at a depth of 4 mm. beneath the skin. The stimulating effects of the light probably penetrate somewhat deeper.

Though the earlier studies of Widmark, Hammer, and Unna on the production of dermatitis and pigmentation by the violet rays; of Graber, DuBois, Bert, and Lubbock on the influence of violet rays on the activities of certain animals; the broader and more fundamental researches in this field of v. Sachs and Jacques Loeb; and the subsequent demonstrations of Friedländer, paved the way for the later investigations of light-therapy, to Finsen belongs the credit of having first made practical and successful use of light in the treatment of disease.

Phototherapy as employed by Finsen and his followers is based on the principle of concentrating a large number of chemical rays of light on a small area, at the same time excluding the heat rays as far as possible. A few seconds' exposure to such concentrated light may produce a superficial erythema, but exsanguination of the area to be treated and long exposures (usually one hour) are necessary to secure deep penetration of the light and to produce an acute inflammatory reaction of the tissues. Sunlight, which Finsen employed at first, and which still is used to some extent by his followers, in summer, is too uncertain in its availability for general use, and is apparently less effective than a strong electric arc light.

The light from a powerful electric arc is condensed by means of a series of lenses so enclosed in a metal tube as to form chambers which are filled with distilled water to absorb the heat rays. The lenses are made of rock crystal, as glass absorbs too large a proportion of the ultra-violet rays. The collecting lenses are 7 cm. in diameter (larger sizes being difficult to obtain and very expensive) and the rays are brought to a focus about six or seven inches from the lower end of the tube. Surrounding one of the divisions containing water is an outer jacket through which ordinary cold water circulates, thus

preventing overheating of the apparatus. In Finsen's original apparatus he employed an arc light of from 60 to 80 ampères and about 70 volts. In each quadrant of the circle around the lamp was placed a system of condensers, thus permitting the treatment of four patients with one light. This apparatus is suitable for institutions where numbers of patients are to be treated daily. A smaller lamp has been devised by Finsen and Reyn in which they use practically the same system of condensers, but by employing one lens of shorter focal distance and by so directing the arc that the strongest rays fall directly on the first lens, 20 ampères and 55 volts give results equal in every way to those obtained by the larger apparatus. The lamp is mounted on an adjustable stand, and is much cheaper to instal and maintain than the original apparatus, and more suitable for use outside of large institutions.

In treating a given area, the patient should be so placed that the light falls perpendicularly upon the surface to be treated, which is brought near enough to the lamp so that the rays are concentrated in a circle from one-half to one inch in diameter. Throughout the *séance* this position must be accurately maintained and the area under treatment must be exsanguinated. The tissues are kept bloodless by means of constant pressure applied by an attendant with specially prepared compressors. These are composed of two quartz lenses so held together by a metal rim as to leave between them a narrow space through which cold water¹ constantly circulates, to prevent the heating of the lens. According to the contour and location of the area to be treated, the lens which comes in contact with the surface may be plane, slightly concave, or convex in varying degrees. For certain sites, as, for example, the inner canthus of the eye, compressors of special shape and size are made. Though in Finsen's Institute these compressors are usually held in place by an attendant, who thus must give her whole time to the treatment of one patient, they are made so that they can be fastened in place by means of a tape or elastic bands. We find that by properly adjusting these bands and by carefully placing the patient, frequently with the aid of a photographer's head-rest, so that the part to be treated is well supported, equally good results are obtained and at much less expense than when each patient requires the constant attention of a nurse or attendant.

The water in the compartments between the condensing lenses absorbs most of the heat (nearly all of the ultra-red) rays, but transmits not only the ultra-violet rays, but also nearly all of the visible spectrum. Consequently if the light be too concentrated the heat may be sufficient not only to cause pain, but also to burn the skin—an effect that should be avoided as it means the destruction of some normal tissue and the consequent production of larger and deeper scars. The amount of concentration which different patients and

¹ The space is so narrow that distilled water is necessary.

different conditions will tolerate varies considerably. It is desirable to use the rays as strong as possible without burning.

The frequency of the applications and the duration of each vary for different conditions and for different individuals. For superficial lesions which can be perfectly exsanguinated, half hour exposures are often sufficient. For deep-seated lesions from one to two hour *séances* may be necessary. On each area the treatment is repeated, when necessary, as soon as the reaction has subsided, which it does usually in from one to two weeks.

Following each treatment an inflammatory reaction occurs in from six to twenty-four hours, varying in degree according to the intensity and duration of the treatment, from a simple erythema to a vesicular or bullous dermatitis which is sharply limited to the area to which the light was applied, though when the reaction extends at all below the surface there is a surrounding narrow zone of œdema. The outline of the area of reaction thus affords a ready test of the accuracy with which the compressor and light were kept in position during the treatment. The vesicles and bullæ dry and form crusts which ultimately fall, leaving only the new forming epidermis. The process requires as a rule from eight to twelve days. The inflammation produced by the light causes no necrosis and no destruction of normal tissue, all of which is conserved. Hence the inconspicuous scars produced and the value of the treatment from a cosmetic point of view. Moreover, the light may be applied freely not only to the morbid area, but also to the apparently normal tissue surrounding it, thus insuring destruction of advancing pathological processes which cannot be recognized clinically. In the normal skin, the reaction on subsiding is followed usually by more or less pigmentation which usually disappears in ten days or two weeks. Another effect of the light upon normal skin is to produce a slight dilatation of the superficial vessels which may persist for six months or more. The sole clinical manifestation of this condition is the readiness with which slight external irritation produces an erythema of the part.

The success of the treatment depends largely upon the care with which the technique is carried out in all details: It is especially important that the lenses, both of the condenser systems and of the compressors, be kept absolutely clean. The latter should be cleansed with antiseptic solutions after each treatment. The distilled water in the chambers of the condensers should be changed often enough to keep it free from particles of dust or dirt, and air bubbles should not be allowed to collect on the lenses.

Though the light treatment has been used most successfully in the treatment of lupus vulgaris and other forms of cutaneous tuberculosis, it is of value in the treatment also of lupus erythematosus, alopecia areata, rosacea, vascular nævi, and some chronic inflammatory cutaneous diseases of circumscribed areas. The special technique appropriate for each of these conditions is considered with the general treatment of each. Phototherapy is limited in its applica-

bility by the fact that the rays can penetrate exsanguinated tissue only, and this but to a limited depth. The area treated at one time is small, averaging less than an inch in diameter. Consequently when the disorder to be treated is extensive the method as now applied is both tedious and expensive.

Numerous lamps have been invented in the effort to produce one with which more rapid results can be obtained and with less expense. They may roughly be divided into two classes:

In the first class, of which the Lortet-Genoud and the London Hospital lamps are the best-known examples, the source of light can be brought within two inches of the region to be treated, the need of a condenser being thus done away with. The patient is protected from the light by a hollow shield in the centre of which are two rock crystal lenses, front and back, between which cold water constantly circulates and absorbs the heat rays. The part to be treated is exsanguinated by pressing it firmly on the face of the front lens. An arc light is employed having carbon electrodes, an ampèrage of 10 or 12, and a voltage of 55. These lamps are in some respects more convenient and less expensive to use than even the Finsen-Reyn lamp, and give good results in superficial lesions, but the light from them has not the penetrating power of that given by lamps which have a series of condensers and employ arc lights with higher ampèrage.

The second class of lamps, of which there are many, are constructed with the aim of furnishing ultra-violet rays in quantity. For this purpose iron or other metal electrodes, or the high-tension condenser spark, have been used. These lamps are small, convenient, of low ampèrage (1 to 4), and therefore less expensive to instal and to maintain. Some of them are powerful in destroying surface-cultures of bacteria and in exciting inflammation on the surface of the skin. As they depend for these effects upon the ultra-violet rays which are absorbed by the uppermost layers of the epidermis, they have no influence upon lesions situated at all deeply in the skin.

Becquerel Rays.¹—In the year 1896, Becquerel discovered the radiating power of uranium and some of its salts. Later the Curie's separated both radium and polonium from pitchblende. From radium and its compounds there are given off at least three varieties of rays. One variety, apparently peculiar to these radioactive substances, are bactericidal and have very slight power of penetrating tissue. The other two varieties of rays have been likened to the cathode and *x*-rays respectively. Observers, however, do not agree fully as to the exact nature and relation of these different forms of radiation.

The effects of radium upon tissue have not been studied sufficiently to warrant definite conclusions, but they seem to be similar in many respects to those of the *x*-rays. Deep-seated dermatitis and

¹ For a review of the subject, and bibliography, see: Turner, Brit. Med. Jour., 1903, ii., p. 1523; MacIntyre, Ibid., 1903, ii., p. 1524; Jumon, Jour. Mal. cutan., 1903, xv., p. 854.

ulceration have resulted from prolonged action of the salts of radium on the skin. London found that in mice radium rays of sufficient strength produced general torpor and death. He has shown also that persons who are almost blind can perceive light when radium is brought near their eyes. It is evidently an agent that should be used with the greatest caution until its properties are better understood and until some method is found of accurately determining the exact radiating power of each preparation used for therapeutic purposes. From the results obtained in a few cases of lupus erythematosus, epithelioma, melanosarcoma, and other morbid conditions, it is probable that when substances possessing a definite radioactive value can be obtained at a reasonable price, radium and its salts may be utilized in the practical treatment of those superficial cutaneous diseases for which the x -rays and the Finsen light are now employed.

Liquid Air and Solidified Carbon Dioxide.¹—These methods of treatment have been developed with recent years. Their action is essentially a caustic one induced by intense refrigeration. Liquid air is difficult to obtain and hence is not always available. It is kept in double walled glass containers which are not sealed, as evaporation must occur with a view to prevent explosion. It is applied to the skin on cotton swabs with moderate pressure. The tissue is immediately frozen white, is very hard and depressed. Within a short time the circulation is resumed, at which time some pain is experienced. Swelling, with redness and bullous formation soon follows. Later changes depend upon the amount of destruction induced. Carbon dioxide snow, suggested by Pusey, is more convenient, readily obtained, and fulfills much the same requirements. It is only about one half as cold. It is obtained from the ordinary liquid carbon dioxide containers and when the snow is collected, it may be moulded into the required shape and applied. These agents are used in the treatment of *nævi* and benign growths, lupus erythematosus and small epitheliomata.

¹ Dade, C. T., *Trans. Amer. Derm. Assn. for 1905*. Whitehouse, H. H., *J. A. M. A.*, 1907, xlix., pp. 371-375. Trimble, W. B., *J. C. D.*, xxx., No. 9, pp. 409-13; *N. Y. Med. Record*, July 8, 1905. Pusey, W. A., *J. A. M. A.*, 1907, xlix., 16, pp. 1354-1356. White, C. J., *J. C. D.*, 1908, xxvi., pp. 505-506. Heidingsfeld, M. L., *Ohio Med. Journ.*, 1908, iv., pp. 466-472. Zeisler, J., *Dermat. Ztschr. Berl.*, 1908, xv., pp. 406-416, and *J. C. D.*, 1909, xxvii., Jan.

CLASSIFICATION.

THE numerous attempts which have been made to classify diseases of the skin according to their nature and relations have been in response to the generally recognized demand for a systematic arrangement of all scientific facts. As regards dermatology, not only have these attempts been numerous and based upon different principles, but the results which they have accomplished have also been in the highest degree divergent. No classification yet devised has secured general acceptance. While it is certain that no one system of classification has been perfect, and that each has exhibited defects, it is equally true that of the large number each has possessed some merit of its own. No perfectly satisfactory classification of cutaneous diseases can be made until the knowledge of diseases of the skin has been greatly enlarged.

One of the most acceptable of the systems thus far proposed is that of Hebra. In it cutaneous disorders are arranged in the following nine classes:

- CLASS 1. Disorders of secretion.
- CLASS 2. Hyperæmias.
- CLASS 3. Exudations.
- CLASS 4. Hemorrhages.
- CLASS 5. Hypertrophies.
- CLASS 6. Atrophies.
- CLASS 7. New Growths.
- CLASS 8. Neuroses.
- CLASS 9. Parasites.

Since this classification was devised by Hebra none has been proposed which compares in ingenuity with the arrangement made by Auspitz. The principle of this classification is to place together those diseases and groups of diseases which present a clinical unity, the general pathological process being the predominant characteristic for selection; individual characteristics, such as symptoms, localization, anatomical peculiarities, etc., being only brought thus predominantly forward when coinciding with the real nature of the class, the group, or the skin-disease in question.¹ Auspitz's nine classes are:

- 1. Simple Inflammatory Dermatoses; 2. Angioneurotic Dermatoses; 3. Neurotic Dermatoses; 4. Stasic Dermatoses; 5. Hemorrhagic Dermatoses; 6. Idioneuroses; 7. Epidermidoses; 8. Chorioblastoses; 9. Dermatomyceses.

Under these classes, by the aid of divisions and subdivisions, an

¹ System d. Hautkrankheiten. Wien, 1881.

elaborate scheme is presented which embraces not only all cutaneous diseases, but also all pathological processes recognized in the skin. The mere presentation of this system has been followed by an advance in the nosology of cutaneous medicine more satisfactory than any since the contributions to this subject by Hebra.

Auspitz's classification, however, is open to various objections on the part of the student of dermatology. It is elaborated to the extent of placing the names of some diseases in more than one family, and hence is confusing to the beginner. It is better adapted to the needs of the expert than of the student, for it introduces to the study rather of morbid processes in the skin than of the complexus of those processes which are recognized in disease.

Whether the principle of classification be anatomical, etiological, or pathological; whether it be based on the processes actually occurring in the skin, or on those deeper factors and forces which operate centrifugally upon the skin, and on which that organ depends for all its functions and even its existence; whether it proceed etilogically from causes which are immediate or those which are remote, it is easy to see that, as knowledge in each of these directions enlarges, the exact position of any one disease in any given classification must be rendered insecure. Never was this observation more suggestive than at this day, when the pathogeny of numerous skin-disorders is revealed in the light thrown on the subject by the discovery of hitherto unknown organisms.

Indeed, to this last cause, awakening grave doubts as to the precision of much that was once esteemed fact, may be attributed the declining interest in the general subject of classification of diseases of the skin. The solution of its problems has practically been deferred by common consent to a date when the questions thus suggested can more satisfactorily be answered. Several recent writers have contented themselves with an alphabetical indexing of the names of skin diseases as an order useful simply for reference.

The arrangement of titles of diseases of the skin in this treatise is a modification of the scheme first proposed by Hebra on the lines recognized by the American Dermatological Association in its classification adopted in 1884. In the successive editions of this work which have appeared since this classification was first accepted, changes from time to time have been made which were rendered necessary by the advancement of science. As the arrangement stands to-day it should be regarded as a mode of grouping diseases for the convenience of the student rather than as an attempt at a scientific classification of diseases of the skin.

DISEASES OF THE SKIN

CLASS I

HYPERÆMIAS AND INFLAMMATIONS

ERYTHEMA.

(Gr., ἐρύθημα, redness.)

(ROSE RASH. *Fr.*, ERYTHÈME; *Ger.*, HAUTRÖTHE.)

Erythema is, strictly speaking, a mere redness of the skin due to congestion of the cutaneous vessels. Much confusion has arisen from the fact that the term is used to indicate a mere symptom, and is also applied to two fairly well-defined groups of cutaneous diseases. Redness of the skin, varying greatly in its intensity, duration, and distribution, is seen in many different conditions and diseases of the integument and of the general economy. In the so-called "idiopathic erythemas" the redness may be the sole symptom recognizable, but it is usually produced by some definite internal or external form of irritation, or is symptomatic of systemic disease. Erythema may simply be hyperæmic and be due to a congestion, active or passive, of the cutaneous blood-vessels, or the process may go on to exudation and inflammation. From a pathological point of view it is evident that no sharp line can be drawn between erythema hyperæmicum and erythema exudativum, yet for clinical purposes it is convenient to make this distinction.

ERYTHEMA HYPERÆMICUM (*seu* SIMPLEX).

Erythema simplex is a coloration of the skin in various shades of redness, diffuse or circumscribed, temporarily disappearing under pressure, the lesions differing in size, hue, and shape according to the extent and degree of the hyperæmia by which they are induced.

Simple erythema is seen in the phenomenon known as blushing. Ordinarily this is a purely physiological and transitory hyperæmia due to emotional causes. Cases occur in which the hyperæmia thus induced persists for hours, together with palpitation and other evi-

dences of circulatory disturbance. Here the erythema is symptomatic of either physical or mental disorder. With the former may be classed those disorders in which portions of the face remain flushed after eating, exercising, exposure to heat, etc.

Under idiopathic erythema have been classed simple forms of erythema for which no cause is recognized. In the great majority of cases a careful search will disclose the disease or condition of which the erythema is but a symptom. The cause may be found in external irritation too slight and too transient to produce a dermatitis, in disturbances of the alimentary canal, in the nervous irritability of children due to "teething," in a drug-idiosyncrasy, or in one of many other derangements of the general economy. Again, the erythema may be a more or less important diagnostic symptom of graver constitutional disease, as in the exanthemata, typhoid fever, etc. The color in erythema may vary from a delicate pink or rosy shade to a dark-reddish hue; it may be transitory or persistent, and may be limited to circumscribed points, or macules, or be displayed in diffuse, ill-defined areas. The character, duration, and distribution of these rashes when due to simple causes often depend largely upon the peculiarity of the individual. The same source of disturbance or irritation may produce different effects on the skins of different persons.

Erythema Traumaticum.—This is the result of friction, rubbing, pressure, scratching, or similar external contacts. It is observed, for example, in the part pressed by the pad of a truss; in the colored circle left about the leg where a tight garter has been worn; and the sides of the nose where pressure is exerted by eye-glasses. Traumatic hyperæmias are readily converted into exudative affections if the traumatism be long continued. Intermittent pressure upon the skin permits restoration of the vascular equilibrium, and the integument responds to the demand made upon it by increasing in thickness; continuous pressure, on the contrary, admits of no such restoration, and the tissue finally becomes thinner, and yields before the agent inflicting the injury. Inflammation resulting in ulceration may finally supervene.

Erythema Caloricum.—Extremes of heat and cold, either natural or artificial, are sufficient to induce transitory redness of the skin-surface. In the erythema induced by solar heat (*Erythema solare*) there is frequently also increased pigmentation of the surface, as in the production of freckles and "tan" in persons whose skins are reddened by the sun. The darker, brownish, and chocolate-colored stains of the hands and face thus are induced. The effects of light are often commingled with those of heat in cases of insolation. The well-known results of exposure to the Finsen lamp, where, in consequence of the cooling of the medium, no heat-rays are effective, include erythema and even active inflammation.

Erythema ab Igne occurs in annular and odd-looking gyrate patches on the anterior surfaces of the legs in cooks, firemen, and stokers, and in persons exposing that portion of the body to the

direct action of heat. The annular patches may be several centimetres in diameter and vary in shade from a light to a deep red or even a purplish tint, intense, often permanent pigmentation resulting as the erythema subsides. Perry¹ believes that the phenomena are due chiefly to a blood-disintegration occurring in and around the walls of the plexus of superficial veins. He adds that the name *EPHELIS AB IGNE* better describes the condition.

Erythema Venenatum.—A number of chemical substances, dyes, and vegetable poisons are capable of producing transient hyperæmia of the skin. Among these may be mentioned cantharides, capsicum, mustard, anilin, chloroform, ether, arnica, several of the dyes used in commerce, and some of the essential oils.

Erythema Gangrænosum.—Erythematous patches in some cases are followed by more or less extensive destruction of one or of several layers of the skin. T. C. Fox, in a description of the appearances in two cases of the affection under his observation, concludes that these patches are the symptoms of a feigned disease, or of one produced artificially for the purpose of exciting sympathy, etc. The majority of these cases are more properly described with dermatitis gangrænosa.

Erythema Læve is an obsolete term once employed to designate the shining redness of the skin in œdema of the lower extremities following any disorder sufficient to induce local tumefaction.

Erythema Paratrimma is a term once employed for the form of deep and lurid redness preceding the formation of a bedsore, an accident which under modern methods of nursing should become as obsolete as the name once given it.

Erythema Fugax is a term applied to a transitory redness of the skin, usually occurring in small areas, which appears and disappears very much as do the lesions of urticaria; in fact, it may well be considered a mild form of urticaria in which typical wheals are absent.

Erythema Urticans is a fugitive form of erythema, commonly accompanied by pruritic sensations, and with the production of wheal-like lesions.

Symptomatic (Toxic) Erythema may be of either active or passive type. Numerous physiological and pathological causes operating upon the system at large are capable of inducing active symptomatic hyperæmia of the skin. These erythemas are toxic in origin. The redness may be generally diffused, or occur in surface-mottlings and markings of various sizes and shapes. Thus, the skin of the face may be reddened intensely in a paroxysm of rage; and that of the limbs of a teething child be covered with rosy maculations in consequence of the reflection to the surface, through the medium of the nervous system, of the irritation induced by the eruption of a tooth. In consequence of the rosy tint assumed by several of these rashes they have been termed "roseola," a name which to-day is held to describe a symptom rather than a disease. The word roseola is still

¹ B. J. D., 1900, p. 94.

associated in the minds of many with the earliest syphiloderm, but that eruption is now best designated as the erythematous, or macular, syphilide.

Roseola infantilis is sometimes described as a distinct affection in which there are fever and constitutional disturbance lasting a few hours or even a few days. The exanthem varies greatly in extent and distribution. It is usually macular or punctate, but may be finely papular; it is most common on the trunk, but may appear on other parts of the body; it may closely simulate scarlatina or measles. These phenomena are generally manifestations of some systemic or local disorder.

Several of the severer constitutional maladies betray their morbid influence upon the central nervous system by a prompt efflorescence of this character. A lurid erythema of the axillary or the inguinal re-

FIG. 34.



Toxic erythema.

gion may precede by several days the eruption of confluent variola. Cholera, cerebrospinal meningitis, diphtheria, enteric and other fevers, are thus at times accompanied, preceded, or followed by

rashes. A knowledge of these rashes is of the utmost importance. Children who are really susceptible to the disease are often supposed to possess an immunity from scarlatina, as the symptomatic erythema previously displayed was misconstrued. Vaccination may be followed in from one to eight or nine days by a macular or more diffuse erythema of the trunk and extremities, usually accompanied by some febrile reaction.

Symptomatic passive erythema is usually characterized by a cyanotic, purplish, or darker hue of the integument, resulting largely from accumulation in excess, of carbon dioxide in the blood. The temperature of such skins is either normal or below the normal standard, as in those cases in which gangrene ensues. There are many conditions in which these symptoms are noted, including derangement of the blood-vessels from imperfect innervation, direct pressure, or disease of the heart or vascular walls.

These erythemas may be either circumscribed in area or generalized. The term "livedo" is applied to circumscribed regions of passive erythema. The nose, cheeks, fingers, or toes may be thus affected as in erythema pernio. The so-called "symmetrical gangrene" of the fingers belongs to the same category. Cardiac cyanosis, or *Morbus Cæruleus*, is a name given to a generalized dark-blue discoloration of the entire surface, due to continued patency of the foramen ovale.

Diagnosis.—The diagnosis of simple erythema is not difficult, since without exudation there is an absence of all other elementary or secondary lesions of the skin. The difficult point in diagnosis is to establish the cause.

Treatment.—In the management of the simple forms of erythema, the removal of the cause is the chief object. Alkaline washes, boric-acid water, zinc-oxid and liquor calcis lotions, or dilute black-wash may be followed by the application of a dusting-powder; or the last may suffice. Exclusion of irritants, as in soap washing, and the somewhat severe domestic applications often employed in the dread of a serious disease, such as erysipelas, "blood-poisoning," etc., will often avail.

ERYTHEMA SCARLATINIFORME.¹

(SCARLATINOID ERYTHEMA, DESQUAMATIVE SCARLATINIFORM ERYTHEMA, SCARLATINOÏDE, ERYTHEMA PUNCTATUM, ROSEOLA SCARLATINIFORME, "SCARLET RASH," DERMATITIS SCARLATINIFORMIS RECIDIVANS. *Fr.*, ERYTHÈME INFECTUEUX.)

Erythema scarlatiniforme indicates an eruption arising from several causes and varying considerably in character, but having a tendency to simulate the rash of scarlatina. This condition has been described as an idiopathic disease, but so often has it been demonstrated to be a symptom only of other disorders that its existence as an independent affection may be doubted.

¹ For bibliography, see *Dermatitis Exfoliativa*.

Besnier, Brocq, and other French authors describe an *erythème scarlatinoïde*, which is acute in type, and which is always secondary to other infectious diseases, to auto-toxæmia, or to medicinal or food-toxæmia; and an *erythème scarlatiniforme desquamatif*, which is subacute in type, and which may be idiopathic, secondary to other infectious diseases, or be produced artificially by drugs. While it is often clinically convenient to make a distinction between acute and subacute forms of scarlatiniform erythema, there are no good pathological or etiological grounds for making such distinctions, since a given drug or given form of intoxication may produce the acute type in one individual and the chronic form in another.

Symptoms.—In the acute type, which is the more common of the two forms, the rash may be preceded by a day or two of fever and other evidences of constitutional disturbance frequently lapsing with the occurrence of the eruption or it may appear suddenly without premonitory symptoms. The exanthem spreads rapidly and in a few hours, or at most in two or three days, reaches its full development. The eruption is commonly universal, or at least generalized, but may be more limited in distribution. The rash may be punctiform, macular, or diffuse, and the color may be any of the shades of red, but it is usually a bright scarlet. In some instances the appearances are those of a typical scarlatinal rash, except that the eruption may begin on any part of the body, often sparing the face, and that desquamation begins much earlier (three or four days after the onset of the malady) than in scarlatina. There are usually some fever, malaise, and other constitutional disturbances that may vary greatly in intensity, depending upon the disease of which the exanthem is a symptom. The mucous membrane of the mouth, the tongue, and the fauces may be reddened or be denuded of epithelium, but the characteristic “strawberry-tongue” of scarlatina is wanting. The nails and hair may be shed, but only in exceptional cases.

Desquamation usually begins in from two to six days, sometimes before the disappearance of the rash, and it may even occur on surfaces which had not perceptibly been reddened. The scales are usually furfuraceous, but they may be large and abundant; in rare instances the entire epidermis of the hand may be shed in glove-like form. Complete involution may require from a few days to several weeks. Rarely the process terminates in a persistent exfoliative dermatitis. Recurrences are common, but in some instances may be prevented by the discovery of the exciting cause.

The subacute forms of scarlatiniform erythema differ from those described above in that constitutional disturbances are less, the rash has a greater tendency to be universal, and, together with the desquamation, may persist for weeks or for months, recurrences being common. At times they are so frequent as to make the condition practically continuous and clinically indistinguishable from the milder forms of dermatitis exfoliativa.

Etiology.—Idiosyncrasy is a most important factor in the etiology

of those forms of erythema which appear in certain predisposed individuals as a result of causes totally insufficient to produce the same phenomena in most persons, as for example in persons exceptionally susceptible to quinine administered by the mouth. The exciting factor is usually, if not always, some form of toxæmia. Among many causes reported are infectious diseases, septicæmic conditions, toxæmias of varied origin, renal disease, peritonitis, rheumatism, ague in children, gonorrhœa, abscess, empyema, tuberculin-injections, sewer-gas poisoning (Crocker), certain articles of food, and many drugs. The causes are sometimes external, as when following mercurial inunctions, exposure to high temperature, etc.

Diagnosis.—It is important to distinguish this rash from that of scarlet fever. Commonly the diagnosis is not difficult, as in erythema scarlatiniforme the constitutional symptoms are slight; the rash appears rapidly, beginning on any part of the body; the lesions are exclusively cutaneous; desquamation begins early and is extensive; the fauces though red are not swollen; and there is absence of the “strawberry-tongue,” of leukocytosis, and of all history of contagion. Occasionally the rash may resemble that of measles or rōtheln, but the history of the case and the absence of other symptoms peculiar to these affections should make the diagnosis clear. As a rule, an examination of the rash alone is insufficient, and a diagnosis of erythema scarlatiniforme should not be made until the other exanthemata have been considered and excluded.

Treatment depends entirely on the underlying cause or condition. Toxines present should be eliminated as rapidly as possible. The rash itself rarely calls for treatment. If there be itching or burning sensations, a simple dusting-powder, with or without an antipruritic or a soothing lotion or ointment, may be used to make the patient more comfortable.

Prognosis.—As a rule the eruption disappears promptly and the general health of the patient is unaffected. Recurrences are frequent, and in some cases terminate in a more or less persistent exfoliative dermatitis.

Shedding of the Skin (*Deciduous Skin, Keratolysis*).—Cases are reported of individuals whose skin is shed periodically like that of a serpent. We had the opportunity of observing the symptoms in the case reported by Frank and Sanford¹ during several of the periods in which the patient's skin was exfoliated. The subject was thirty-three years of age, well formed, and apparently in perfect health. No cause for the skin-shedding could be found. He stated that ever since he could remember, and certainly since he was eight years old, he had had peculiar symptoms which began between 3 and 9 P. M. of the 24th of July, each year. He would suddenly experience a feeling of lassitude or weakness, followed by muscular tremors, nausea, and vomiting, with rapid rise in temperature. Accompanying these symptoms the mucous membranes were hyperæmic;

¹ Amer. Jour. Med. Sci., Aug., 1891.

the skin became hot, dry, and destitute of perspiration. After three or four hours the acute symptoms began to subside, but the skin remained red for thirty-six hours or longer. The shedding of the skin began usually on the second or third day, and was completed in from three to ten days. On the occasions observed by us, the mucous membrane of the tongue and mouth exfoliated on the third day; the epidermis was removed from the trunk and arms in large sheets on the sixth day; and from the remainder of the body, except the hands and feet, within the next three days. Complete casts of the hands and feet were shed by the seventeenth day, and the nails all came off within a month from the beginning of his illness.

This case was observed the following year and reported by Sligh.¹ Sligh's report confirms the facts we observed. Similar cases are reported by Stelwagon,² Stone,³ and others.

ERYTHEMA PERNIO.

(PERNIO, "CHILBLAINS." *Ger.*, FROSTBEULE; *Fr.*, ENGELURE.)

Erythema pernio occurs in persons having a feeble circulation or of strumous diathesis, usually in the young and the very old. Permin⁴ calls attention to its frequent occurrence in the tuberculous. The redness is most conspicuous, as a rule, on the hands and feet, merely because of the distance of these organs from the centres of circulation. The redness is of either a light or a dusky shade; is accompanied by tenderness, itching, and burning sensations, especially when the part is brought near an artificial source of heat; and may be the origin of exudative and other affections of the skin, though the ulceration and sloughing which occur in extreme cases are really the results of freezing the organs rather than of simple exposure to cold when the circulation is impaired.

Diagnosis.—The diagnosis is readily made when it is observed that the redness disappears on pressure, and also that the parts are actually cool rather than hot, the coolness being appreciable by the touch. Not rarely the involved surfaces are both cool and moistened with sweat. Pernio may closely resemble an early stage of lupus erythematosus, but the latter does not vary regularly with the seasons as does pernio, which usually disappears in summer and reappears in winter. The two conditions are at times related, as individuals are seen with pernio of the hands or the feet, and lupus erythematosus of the face. Cases are recorded in which the site of a recurring pernio has become the seat of a typical lupus erythematosus.

Treatment.—The treatment of pernio should be directed to improvement of the circulation and the general health. Warm clothing

¹ Sligh, Unique Case of Annual Shedding of Skin (3 plates). *Internat. Med. Mag.*, 1893, p. 463.

² *Diseases of the Skin*, 5th ed., p. 143.

³ Stone, R. M., *Jour. of Am. Med. Ass.*, 1900, Sept. 1, p. 557 (2 cuts).

⁴ *Hospitalstidende*, 1903, xviii., Copenhagen (abstr. in *Brit. Jour. Derm.*, 1903, xv., p. 376).

to protect the affected parts together with active exercise may do much to prevent recurrence of the disease. Fowler's solution is considered a prophylactic if given in small doses at the beginning of cold weather. The local treatment is by brisk friction and stimulating lotions, such as camphorated soap-liniment; acetous, spirituous, and vinous lotions; or the use of the ordinary "bay rum" of the shops. Afterward the parts should be painted with a 50 per cent. solution of ichthyol, well dusted with boric acid, and bandaged or wrapped in cotton. The severer forms of the disease are considered under *Dermatitis Calorica*.

ERYTHEMA INTERTRIGO.

(INTERTRIGO, ECZEMA INTERTRIGO, CHAFING.

Fr., ERYTHÈME INTERTRIGO.)

Erythema intertrigo is a hyperæmic condition of those cutaneous and muco-cutaneous surfaces which are in constant apposition, and between which there is a hypersecretion or retention of sweat.

Symptoms.—The erythema is limited to portions of the integument which lie in contact with each other, and are subject to certain modifications. The sites of such contact in the human body are the axillæ, the groins, the cleft between the nates, the intermammary and inframammary spaces in women, the superior and inner faces of the thighs, the scroto-femoral and the labio-femoral clefts in the sexes respectively, the flexures of the joints, and in especially obese individuals all those parts where the integument is thrown into fleshy folds, as about the neck of infants, and even over the crest of the ilium in fat subjects. In these localities the disorder, beginning as an erythema traumaticum, proceeds by its irritative effects to stimulate the secretion of sweat, which is freely poured out between the adjacent folds of the skin, and may there temporarily be imprisoned. The surface, heated and reddened, is also somewhat macerated by the effused perspiration, and the latter, when chemically altered, as it is frequently under these circumstances, adds still further to the original disorder. The ground is thus well prepared for an exudative process, which not infrequently supervenes in the form of a dermatitis; but the disorder may be limited to mere hyperæmia with hyperidrosis, and disappear before the supervention of actual inflammation.

The sensations produced are those of heat and tenderness. When the parts in contact are separated the surfaces are seen to be reddened and chafed. Here and there very superficial abrasions of the macerated epidermis become evident. One such abrasion is always especially significant. It is the linear and superficial excoriation which marks the line of deepest contact of the two apposed surfaces of the skin at the bottom of the angle formed by the two. An offensive odor usually proceeds from the part in consequence of the chemical changes in the secreted fluid. The secretions of an intertrigo stain,

but do not stiffen, the linen of the patient, and they thus differ from the serous fluid poured out in an exudative dermatitis.

Etiology.—The disease is chiefly induced by heat, friction, and moisture—these causes occasionally coöperating. The heat may merely be that of the natural temperature of the body, or it may be increased by that due to season and climate. The friction also may merely be that originating between the surfaces in apposition, or it may be increased by clothing or other articles worn next the skin. The moisture which produces maceration of the epidermis is that originating in the perspiratory follicles, their secretion being doubtless stimulated by the heat and friction. The interchange of operation of these three factors, lastly, is shown by the fact that friction, if severe, is capable of increasing the temperature of the part to which it is applied.

As aggravating causes may be named physiological secretions and excretions retained in contact with the surfaces affected with an intertrigo. Thus, the feces of the infant left in contact with its nates upon the napkin; the urine of the old man with paralysis of the bladder or with “overflow” from prostatic disease; the milk of nursing women dribbling over the breast to the inframammary region; retained lochial, menstrual, and similar discharges; and glycosuria are all efficient in this regard, and are particularly liable to induce that form of dermatitis to which the intertrigo then plays a subordinate part. Fleishy and gouty persons chiefly suffer from these accidents.

Diagnosis.—The recognition of a simple erythema intertrigo is a matter of no difficulty if regard be had to the exciting and aggravating causes enumerated above, and to the special localities in which such hyperæmia generally originates. If an eczema or a dermatitis supervene, the fact will appear from increased subjective sensation (usually severe itching), from an infiltration of the affected integument, and from the appearance of those lesions and discharges which are significant of these forms of inflammation of the skin. It must be remembered that transition from a simple erythema to a dermatitis of these regions is of frequent occurrence. Erythema intertrigo may occur as a mild form of dermatitis seborrhoeica.

The special sites of preference of intertrigo are those of the disease named by Hebra “eczema marginatum,” or ringworm as it occurs upon the parts of the thighs covered by the “reinforcing” patch in the trousers of cavalymen. The disease is properly named *Tinea circinata cruris*, though it is found also about the axillæ, the buttocks, and the groins of both sexes. Here the disorder, however, is of the exudative type, and, moreover, is distinguished by a characteristic “festooning” of the elevated border marking the advancing limit of the disease. The microscope, by revealing the existence of a fungus, will put an end to any doubt. In intertrigo the most marked evidence of disease is to be recognized in the deeper parts of the cleft between the two adjacent skin-surfaces, while in *tinea circinata cruris* the growth of the parasite is most active at

the advancing border of the patch, which is, moreover, perceptibly elevated above the sound skin.

Treatment.—Intertrigo is an exceedingly common affection of the skin, and it occasionally proves of great annoyance to those suffering from it. Gouty patients always require limitation of the diet, and often also medication with alkalies and mercurial cathartics.

The affected surfaces should be cleansed gently by ablution with soap and warm water, and the offensive odor of the secretions remedied by the addition to the water of a weak solution of formalin, of carbolic acid, or of the dilute liquor sodæ chlorinatæ. The parts are then to be carefully dried with a freshly laundered towel or soft gauze, and afterward one of the dusting-powders very thoroughly applied. To be of service, these powders must be impalpable, and, if compounded by a druggist, be sifted through fine silk bolting-cloth. The articles chiefly used for this purpose are zinc stearate with acetanilid, bismuth, starch, zinc oxide, French chalk, lycopodium, or, when an antipruritic effect is desired, camphor. Combinations of several of these are at times effective. The formula of McCall Anderson is highly esteemed:

℞	Zinci oxid. pulv.,	℥ss;	16	
	Camphoræ pulv.,	℥jss;	6	
	Amyli pulv.,	℥j;	32	M.
Sig.—Anderson's dusting-powder.				

For the purpose of absorbing excessive perspiration magnesium carbonate is the most effective of all the powders.

The following is the formula for a dusting-powder recommended by Klammann:¹

℞	Talc. venet. pulv.,	℥v;	20	
	Acid. salicyl.,	gr. iij;	20	
	Magnes. ust. subtil. pulv.,	℥jss;	6	M.
Sig.—Dusting-powder.				

Finely bolted starch answers well alone or in combination with some of the other articles above named.²

The affected surfaces of the skin must also be separated in order to prevent further friction. A thin strip of lint, gauze, antiseptic cotton, or medicated wool may be used for this purpose, and must be inserted as far as the deeper portions of the cleft in which the secretion chiefly forms. Occasionally it will be found useful to anoint this absorbent layer with borated cold-cream salve or with vaselin. Where an astringent effect is desired lycopodium or other dusting-powder may be compounded with tannin, alum, or similar substances. The list of lotions also may at times be consulted with advantage. Thus, cologne-water, saturated aqueous solutions of pyoktanin blue, weak spirit lotions containing tannin, aromatic wine, or zinc oxide and lime-water, may each be serviceable. Lastly, equal parts of lime-water and olive-oil, spread thickly upon linen, will possibly give

¹ Hebam. Kalend., Obstet. Gazette, March, 1882.

² Unna's salve-muslins and pastes will be found effectual and neat applications in many forms of intertrigo.

more relief than other articles named, the chief objection to it being the consequent soiling of the patient's clothing.

ERYTHEMA MULTIFORME.

(ERYTHEMA EXUDATIVUM MULTIFORME. *Fr.*, ERYTHÈME POLYMORPHE.)

Erythema multiforme is an acute, inflammatory, exudative disease, characterized by crimson-red or purplish-red macules, papules, or tubercles, with the occasional appearance of vesicles or bullæ, the lesions being variously grouped or isolated, and due usually to some systemic disturbance.

Symptoms.—In this affection the most common lesions are œdematous-looking macules, flattened papules, and even large flat nodosities. Vesicles and bullæ develop in some cases. While multiformity is the rule, one type of lesion usually predominates in each case. The

FIG. 35.



Erythema multiforme.

eruption is nearly always symmetrical, and occurs usually upon portions of the extremities, the forearms, the legs, and the dorsum of the hands and feet. It occurs exceptionally on other parts of the body, and rarely upon the mucous membrane of the mouth, nose, and conjunctiva. It has been seen on the sclerotic. From the beginning the lesions are more or less flat, elevated, and œdematous. The eruption, which is generally recognized in well-defined patches, usually begins with pinhead- to finger-nail-sized macules of a darkish, bluish-, or purplish-red shade that lose their color under pressure, and in the course of some hours exhibit tumefaction in various degrees, thus producing the papules, tubercles, and nodes already described. In many cases there is a remarkable tendency to a flatten-

ing and widening of the lesions to the point where they closely resemble a floridly tinted condyloma. The disease may persist for but a few days, but in severer grades it may last for several weeks or months. Recurrent attacks through a period of years are not uncommon. At the height of the exudative process there is usually an efflux of the coloring-matter of the blood into the skin which is the site of the several lesions, and thus are produced the singular shades of reddish black, purple and red, blue and red, yellow and orange,

FIG. 36.



Erythema multiforme.

black and blue, that are characteristic of simple bruises of the extremities when the injury has been sufficient to cause extravasation of blood. The lesions occur in various shapes, sizes, and shades, a number of names having been used to designate their several appearances that require explanation though they are without practical value.

The exanthem is peculiar in that it is especially likely to develop and recur in the spring and autumn, is not capable of being awakened to activity by external irritation solely, and is productive of rather insignificant subjective sensations (burning and smarting) as compared with other rashes of even less brilliant hue.

Erythema Annulare (or Circinatum) is characterized by a central depression and paling of color, and a peripheral extension of the erythematous patch in the form of rings which may be concentrically arranged.

Erythema Figuratum occurs in gyrations formed by coalescence of two or more annular circles.

Erythema Induratum is considered with the tuberculous affections of the skin.

Erythema Marginatum is that form of the disease in which a distinctly elevated and defined marginal band is left as the sequel of an erythematous patch.

Erythema Papulatum (or Papulosum) and Erythema Tuberculatum (or Tuberculosum) are those forms in which occur lesions respectively of a papular or tubercular type, pea- to bean-sized, flattened, discrete or closely packed together, usually of a characteristic empurpled hue.

Erythema Urticatum is that form in which there is severe itching, and, as a result, scratching of the lesions, with crusts of dark dried blood at the summit of each. The crust is surrounded by the light-red or bluish-red, flattened or elevated patch characteristic of the disease.

Erythema Vesiculosum and Erythema Bullosum are exceptional forms in which the exudation is sufficient to raise the horny layer of the epidermis into larger or smaller serum-containing chambers, which may be, as regards the erythematous patch, of central or peripheral situation, and which may crown the summit of papule or tubercle. The fluid is usually removed by absorption, and is rarely set free by rupture of the vesicle or bleb.

Bloch,¹ however, observed a fatal case of toxic erythema where the dermatosis was erythematobullous in character. Vesicular lesions occurred on the mucous surface of the mouth, nose, and labia. Some of the lesions became gangrenous; the patient died of Hodgkin's disease.

Erythema Iris (*Herpes Iris, Hydroa Vésiculeux*) is the result of the evolution of successive erythematous centric lesions, which at times form several differently shaded concentric rings. The dorsum of the hand is the usual seat of this efflorescence.

At the onset there appear one or several vesicles or vesico-papules, which pursue their rapid career in two or three days. Upon the hyperæmic ring which surrounds these lesions a second and even a third or fourth circle of similar lesions form, each pushing the areola further to the periphery of the patch. The older lesions are in full retrogression, while the newer vesicles are in process of evolution; and the red blush which surrounds the earlier lesions is undergoing color-changes from vivid to purple and paler hues, while the zone of the latest vesicles is assuming its intensest shade. The lesions are pinhead- to pea-sized, rather persistent and firm, and terminate more often by resolution than by rupture and crusting. The concentric and parti-colored rings may make up a single patch an inch or more in diameter, or several such patches may form upon the surface of the integument. In the latter case the central disk of some of the patches will be seen to be composed of confluent lesions. The subjective sensations produced are usually trifling.

¹ Archiv, October, 1907, lxxxvii., p. 217.

Atypical forms occur in which the lesions are developed imperfectly from papules, and also in which, in consequence of an unusual exudation of serum, bullæ appear. These may coalesce or be filled with blood; or hæmaturia may result, with severe involvement of the

FIG. 37.



Erythema multiforme.

mucous membrane of the lips, the tongue, the soft palate, and other parts of the mouth, ulceration rapidly ensuing. Cases with these complications should really be classified with the grave forms of pemphigus, to which they properly belong.

Erythema Nodosum (*Dermatitis Contusiformis*. Fr., *Erythème Nodieux*) is a form of erythema multiforme, regarded by some authors as a distinct affection, in which the characteristic lesions are of the dimensions of semi-globular pea- to fist-sized nodes or tumors, pale-red, pinkish to livid blue in color, tender upon pressure, and exhibiting in their involution the variegations of hue already described. They occur chiefly upon the legs and dorsum of the feet, but also more rarely upon the trunk and the face. Though occasionally so soft to the touch that fluctuation may seem to be present, they do not terminate by suppuration.

Unna lays stress in the distinction between this disease and erythema multiforme upon the fact that the lesions of erythema nodosum never widen concentrically, never produce bullæ, and never exhibit annular vesicles, but the lesions of both types may concur in one individual.

Symptoms.—The nodose lesions usually few in number and at times developing in crops occur most often in youth, in girls more often than in boys, with acute or subacute symptoms frequently with rheumatoid pains and febrile temperatures in various grades. The oval or roundish, erythematous or empurpled nodes, varying in size from that of a small nut to that of a pigeon's egg, are most often seen on the lower limbs, especially over the tibiæ, though they appear also on the buttocks, and the forearms. Rarely the mucous surfaces of the mouth and throat are invaded. They are usually tender on pressure, and often painful. They may disappear in a fortnight, but

occasionally observe a stadium of six weeks' duration, forming and disappearing in crops. The petechial appearance of the spots where they have existed is that of the characteristic "black-and-blue" mark. The eruption may occur in tuberculous subjects and appears often among the poorly nourished and ill-housed. It occurs most frequently in the spring and autumn, and is not infrequently associated with arthritis or a rheumatic diathesis. Other causes cited are: malarial chills, temperature changes, endocarditis, urethral irritation (blennorrhagic, instrumental), medicamentous ingesta, alcoholic excesses, and dentition.

Pathology.—The pathology of erythema nodosum is that of the toxic erythemata in general. Sections of lesions exhibit the common signs of inflammation, vascular dilatation, small-celled infiltration in the papillary and subpapillary layers of the corium, choking of lymphatic and blood-vessels, and œdema of the cells.

The lesions of erythema nodosum should be carefully distinguished from those of erythema induratum (which see); from the gummata of syphilis, which they often resemble; and from the results of traumatism of the skin, especially of the shins. The frequently brilliant color of the erythema lesions, their failure to suppurate, their association with rheumatoid and other systemic conditions, and their localization will commonly suffice to establish a diagnosis.

A number of medicaments, when ingested or externally employed, are capable of producing eruptions identical in appearance with the lesions of erythema multiforme. For description of these the reader is referred to the sections devoted to *Dermatitis Medicamentosa* and *Dermatitis Venenata*. Quinine, arsenic, belladonna, chloral, salicylic acid, iodine and bromine compounds, and other substances are often responsible for these symptoms.

The designation "multiform," given to this disease by Hebra, is justified by the singular diversity of lesions which it displays. The lesions are remarkable, not merely for their variety, but also for their occurrence in such variety both simultaneously and successively, and for their rapid change from one type to another.

The subjective symptoms, save in the urticarial form of the disease, are usually of a trifling character. The slight sense of heat and burning awakened by the lesions is altogether out of proportion to the extent of their development.

The symptoms, however, indicative of a general disturbance of the system may be of a marked character. General malaise, fever, inappetence, pharyngeal inflammation, chills, severe gastro-intestinal disorder, rheumatoid involvement of the articulations, and even organic changes in the heart (valves, endocardium, and pericardium), lungs, and kidneys have all been noted as coincident or as causative phenomena. In many of these cases it is clear that the exanthem belongs to the list of symptomatic erythemata, and that it is of insigni-

PLATE II



Erythema Multiforme, Circinate Type.



nificance in comparison with the grave general condition. It may thus be the precursor of typhoid fever, malaria, renal disease, severe articular rheumatism, or may become even an abortive expression of these disorders. With these exceptions, however, the prognosis is in general favorable, as the disease may terminate in a few days, and rarely exceeds a month in duration.

Occasionally the mucous membranes are affected to a disagreeable or even painful extent. Thus, a sudden tumefaction of the uvula may supervene upon the cutaneous symptoms, in cases sufficient to impede respiration; or the lining membrane of the larynx may be involved, and the resulting aphonia in various degrees persist for two or three days.

Lublinski¹ classifies the several erythemas recognized under this title according to Heubner's scheme: as (1) simple cases of erythema exudativum multiforme, and erythema nodosum, with symptoms varying according to the anatomical site and grade of the inflammatory process; (2) acute exanthematic forms (*Erythema infectiosum*) recognized in measles and scarlatina; (3) grave septicæmic forms, where the infective process often starting from the tonsils, involves later the cervical glands and produces a streptococcic infection of the system.

Etiology.—The affection is commonest in spring and autumn; it occurs in the young or in the early periods of adult life; the papular and tubercular forms occur more often in men, and the nodose forms in women; many patients are affected with rheumatism. In three valuable contributions to the study of the visceral complications of the erythema group Osler² has shown that the cutaneous symptoms may be merely surface-expressions of a visceral disorder; and indeed that the skin-symptoms may wholly be absent when the disease is in progress. In the twenty-nine cases studied by him there were three sets of symptoms: (*a*) polymorphous skin-lesions, including acute circumscribed œdema, urticaria, purpura, and ordinary forms of erythema multiforme; (*b*) visceral lesions, including (1) gastro-intestinal crises in which severe colic, with or without vomiting, diarrhœa, or bloody stools, was frequent, (2) hæmaturia and nephritis, (3) hæmorrhages from mucous surfaces, (4) cerebral symptoms, (5) pulmonary complications; and (*c*) infiltration of synovial sheaths and periarticular tissues, and arthritis. In some of his cases a given visceral lesion had been accompanied at different times in the same individual by each of the types of cutaneous lesions.

The etiology of erythema multiforme includes a list of varying and widely differing causes. Among the concurrent disorders may be named: cardiac affections, diphtheria, Bright's disease,³ toxæmias, and neurotic disturbances. Severe manifestations of the disease have

¹ Angina und Erythem. Lublinski, Med. Klinik., 1906, Nr. 19; Archiv, 1907, 83, p. 144; Centralbl., 1906, No. 11, p. 332.

² Amer. Jour. Med. Sci., 1895, n. s., ex., p. 629; B. J. D., July, 1900, xii., p. 227, and Amer. Jour. Med. Sci., 1904, cxxvii., p. 1, with general survey of subject.

³ Cf. Vredensky, Vratel, 1901 (abstr. in B. J. D., 1902, xiv., p. 360).

been observed in women with extensive ulceration of the cervix uteri. Tilbury Fox noted frequency of symptoms in young servants brought to town from the country. It is not rare in young female immigrants who have recently made a "steerage" passage to America. Mackenzie¹ has called attention to the relationship of erythema multiforme to rheumatism and to purpura rheumatica. Polland² cites an observation in which necrotic lesions of multiform erythema developed in a case of acute nephritis.

Galloway³ calls special attention to the influence of malaria as a cause of erythema.

There can be little doubt that erythema multiforme, arthritic purpura, urticaria, and acute circumscribed œdema are closely related. The reasons for such belief, as stated by Osler, are: the similarity of conditions under which these disorders occur, the identity of the visceral manifestations, and the substitution of these affections for each other in one and the same patient at different times. The cutaneous changes are undoubtedly due to the presence of toxins, which may not always be the same at different times even in the same individual. Moreover, the character of the toxin in a given case evidently is less effective in determining the exact nature of the cutaneous changes than is the individual idiosyncrasy or the temporary condition of the tissues.

Pathology.—Erythema multiforme is essentially a hyperæmia of the integument that, under certain obscure influences, advances more or less rapidly to the stage of a mild grade of inflammation with consequent exudation. If, with Landois and Lewis, it be accepted that the process is the result of vasomotor nerve influence, it cannot be determined whether the nerves are irritated at their points of origin or of distribution. In the case of erythema nodosum Hebra advanced the hypothesis that the morbid process is essentially an inflammation of the lymphatic vessels. In some cases it is evident that there is extravasation of blood from the vessels into the skin of the affected part.

Leloir⁴ discovered in the papules, tubercles, and bullæ of erythema multiforme only the phenomena of hyperæmia and exudation limited to the corium and subcutaneous tissue; and Villemain⁵ simply confirms these facts. Singer⁶ has shown that the skin-lesions in erythema multiforme are for the most part evidences of staphylococci and streptococci in the blood. Crocker, examining a patch of erythema tuberculatum, recognized merely a cell-effusion in the upper portion of the corium extending sparsely below, and then chiefly along the ducts and follicles. There was slight rete-proliferation. Unna recog-

¹ B. J. D., 1896, viii., p. 116.

² Polland, R., Archiv, 1906, 78, pp. 247-254. 1 Clin. Illus. Bib.; Annales, 1906, 7, p. 514; Monatshefte, 1906, 42, p. 416; Jour. mal. Cut., 1907, 25, p. 41.

³ B. J. D., 1903, xv., p. 235—a review of the causes of the different types of erythema and of their relations to systemic conditions.

⁴ Bull. de la Soc. anat., 1884, lix., p. 294.

⁵ Gaz. hebdom., 1886, Nos. 22 and 23.

⁶ Wien. klin. Wehnschrift., 1897, p. 38.

nizes both in erythema multiforme and erythema nodosum: vascular dilatation, cell-proliferation especially around the vessel-walls with cell-emigration, and œdema of the cutis. In two cases of the iris-type Pardee¹ found simply an acute exudative inflammation of the upper part of the corium. Török² and Kreibich³ also find the condition to be a simple dermatitis and not an angioneurosis.

Diagnosis.—Erythema multiforme is always to be carefully distinguished from the traumatism producing bruises, especially upon the lower extremities. This point may have an interesting bearing upon certain medico-legal questions, especially in the case of young children.

The tendency of the disease here considered to symmetrical arrangement upon the two sides of the body, the recurrence of lesions evidently dating from several periods in which successive crops appear, and the absence of all history of external injury, will usually suffice to establish a diagnosis. Among the precocious affections of the subcutaneous connective tissue in syphilis, Mauriac described a lesion resembling somewhat the symptoms of erythema nodosum; but in such cases, and especially in women, mucous patches of the vulva, of the anus, or of the mouth, with coincident adenopathy, would point to the real nature of the disease. Syphilitic nodes and gummata are distinguished from the lesions of the nodose forms of erythema by the absence of pain in the former, their fewness, their overlying integument untinted save when actually softening and approaching disintegration, their obviously subcutaneous site, and the usual concomitant symptoms of late lues.

The chief points by which a diagnosis of the erythemata in general is established are: the recognition of the vivid coloring of most of the lesions; their œdematous character; their symmetry as a rule; the pigmentation following those situated on the lower limbs; their frequent association with rheumatism or rheumatoid pains, febrile phenomena, malaise, and other constitutional disturbances. The wheals of urticaria are smaller, more whitish centrally, more closely packed together, less symmetrical, rarely grouped, and, as a rule, decidedly more acute than those of erythema. Cases difficult to assign to either disease are common, and an error in either direction is not serious. Rubella (German measles) is to be distinguished by its adenopathy, its pharyngeal symptoms, and its flattish spots. In eczema erythematosum there is less definition of each patch, and the redness is commonly diffuse; papular forms of eczema are usually commingled with other readily distinguished symptoms of that disease.

The relations and distinction between erythema multiforme and erythematous lupus are of special interest. Galloway and MacLeod⁴ call attention to the obvious relation between the two types of congestion of the skin, both due to toxines differing in virulence and

¹ Johns Hopkins Hosp. Bull., 1898, ix., p. 165.

² Archiv, 1900, liii., p. 243 (with review and criticism of various theories advanced regarding the nature of the disease).

³ Ibid., 1901, lviii., p. 125.

⁴ B. J. D., 1908, xx., 3, 65.

character and actively affecting regions of defective peripheral circulation, the one acute and transient, the other prolonged.

Potassium iodide and a few other drugs administered internally are capable of producing almost every one of the lesions described above. In the erythemata for which iodine and bromine salts have been administered, with the production of skin-symptoms, the confusion produced becomes a fruitful source of error.

Treatment.—As in the majority of instances the disease under consideration progresses naturally to a favorable termination within the course of a few weeks, the duty of the physician is usually limited to the question of diagnosis and to a study of the etiology in each case, with the purpose of preventing future attacks. He should remember that the larger lesions seen in erythema nodosum never suppurate, and thus should not be tempted to open them surgically. Local treatment is often unnecessary. For the relief of the slight burning or itching present in some cases a dusting-powder, sedative or anti-pruritic lotion, or protective dressings, such as are recommended for the treatment of acute eczema, may be employed. Bullæ and vesicles should be evacuated and protected with a simple aseptic dressing. Internally such medication should be employed as is indicated by the general condition of the patient. Iron, quinine, aspirin, the salicylates, salol, strychnine, and dilute hydrochloric acid will be found beneficial in many cases. Constipation and indigestion are to be corrected by appropriate measures. A full dose of calomel or blue mass, followed by a saline laxative, is demanded in many cases to aid in the elimination of intestinal toxins. When the disorder accompanies rheumatic or other systemic disease, internal treatment is to be directed to the general condition present. When the erythema produces extensive œdema of the uvula, incisions may be requisite to prevent dyspnœa and dysphagia.

Prognosis.—It will be gathered from what has preceded that the prognosis is usually favorable, but necessarily varies with the constitutional disease of which the erythema may be a mere symptom. The malady may relapse in susceptible individuals at those periods of the year when it is observed most frequently.

The fatality in certain cases is due to the severity of the systemic infection as in that of Ledermann and Welonder;¹ in others, for example that of Polland,² the lesions may become necrotic and be invaded by the gangrene-bacillus.

ERYTHEMA PERSTANS.

(ERYSIPELAS PERSTANS FACIEI (KAPOSI).)

Erythema perstans is characterized by a brilliant scarlet or dull-hued, more or less persistent redness affecting the face and other parts of the body-surface, chiefly in children but also in adults. When

¹ Med. Klinik., 1908, No. 19; Archiv, Bd. 72, Heft 2.

² Archiv, Bd. 78, Feb., 1906.

the face is involved, the cheeks, tip of the nose, and ears of the child exhibit infiltrated and often gyrate patches. The primary scarlatini-form aspect changes later to a bluish or bronze-like hue. In adults small nodular lesions may appear; and at all ages, the erythema is due to a fibrinous inflammatory exudate associated with intense vascular injection, the result of a toxæmia which may last for weeks and even longer. In Lenglet's three observations, the symptoms resulted from renal insufficiency. Kreibich observed the disease as a sequel of influenza-pneumonia. In Whitfield's carefully observed case, the blood-coagulation was slow, and the infiltration speedily disappeared after exclusion of vegetable acids from the dietary, and administration of calcium lactate.¹

Under the title *Erythema Figuratum Perstans*, Wende² describes cases observed by himself and others, in which isolated papules, fading centrally and extending peripherally, furnish plaques with circinate outlines often with a raised margin. Confluent, gyrate, "zig-zag," annular, and other forms of eruption occur, at times with concentric rings. In some instances the disease had existed since early childhood.

ERYTHEMA INFECTUOSUM.

(ERYTHEMA CONTAGIOSUM.)

Under these titles, Shaw-Albany,³ describes a mild efflorescence occurring in children, affecting chiefly the face and extremities, the exanthem resembling somewhat rōtheln in which maculo-papular, rose-tinted lesions develop at times an erysipeloid aspect. The disease under the second of the titles given above was first described by Escherich, of Prague.⁴

ERYTHÈME MILIAIRE LEUCOGÉNIQUE PRURIGINEUX CHRONIQUE.

Milian⁵ under this title describes pin-head-sized lesions having the form of elevated reddish spots with a whitish zone, the seat of intolerable pruritus, developing on the trunk and extremities, and following urticaria. The eruption seems to have resembled urticaria pigmentosa.

¹ Literature: *Erythema annulare perstans*, Bellman, Inaug. Dissert. Leipzig, 1904; Monatshefte, 1905, Bd. 40, p. 345.

Erythema perstans faciei, Über die Aetiologie des; Kreibich, Derm. Zeits., 1908, Bd. 15, Heft 8, p. 522.

Erythème: La rongeur permanente de la peau dans l'insuffisance surrénale. Soca. La Tribune méd., 19 Janvier, 1907, p. 37. Annales, 1908, 9, p. 36.

Erythema, Persistent, Whitfield, B. J. D., 1906, 18, pp. 254-255.

Erythema perstans faciei (*Erysipelas perstans faciei*, Kaposi), Kreibich, Monatshefte, 1906, 43, pp. 443-450.

² Tr. Amer. Med. Ass.; Sect. Cut. Med.; 1908, p. 75 (with plate).

³ Amer. Jour. of the Med. Sci., Jan., 1905.

⁴ Wien. klin. Wochenschr., 1904, No. 22, and Monatshefte, 1906, pp. 24-42.

⁵ Annales, 1906, 7, p. 48; Cutan., 1907, 25, p. 128.

GRANULOMA ANNULARE.

(ERYTHEMA ELEVATUM DIUTINUM, ERYTHEMA SCLEROTICUM, PEMPHIGOID SCLEROTIC ERYTHEMA, CHRONIC ERYTHEMA MULTIFORME, "RINGED ERUPTION," LICHEN ANNULARIS, SARCOID TUMORS, TUMORES BENIGNI SARCOIDEI CUTIS. *Fr.*, ERYTHÉMATO-SCLÉROSE, ERUPTION CIRCONÉE CHRONIQUE DU DOS DES MAINS.)

A somewhat rare dermatosis, chronic in course and occurring in both children and adults, has been described under the titles given above by Galloway,¹ Crocker and Williams,² Audry,³ Hutchinson,⁴ E. Graham Little⁵ and others.

Symptoms.—The patients thus affected, usually children, have displayed firm, solid, sharply circumscribed, elevated, pinkish, reddish, purplish or bluish-red nodular plaques, disposed often over the bony articulations of the smaller joints, especially over the hand (fingers), wrist, and feet, but also over the face (rarely the cheeks), elbows, buttocks, and lumbar region. The disease begins commonly with the development of whitish or reddish circular spots, which soon become elevated above the general level and increase to discrete or grouped papules and nodes with extension in cases to lesions two centimetres in diameter. Often they have a lucent, sclerotic surface; they disappear after persistence for months, with or without crusting, by leaving dull reddish blotches, though atrophic lesions and scars have occasionally resulted. In some instances a dark or violaceous zone surrounds the single or grouped lesions. There are few if any subjective sensations. The cause is obscure. In adults rheumatism and gout have been thought to be efficient factors. The disease usually begins in the summer months. The sexes are equally affected.

The exact relation which subsists between the conditions severally described as "granuloma annulare" and "erythema elevatum diutinum" is difficult to determine. The strong resemblance between the cases carefully indexed by Little and those described by other authors under the second of the two titles named, is certainly significant. In addition to the cases cited by Little as observed by us, we have lately had the opportunity of studying the symptoms in a female child five years of age where the nodules on the outer face of the left ankle, over the malleolus, were precisely similar to those represented in the photograph of our first case reproduced in Little's paper.

Bohac,⁶ describes the case of a woman 38 years of age, who suffered from recurrence of a lesion $3\frac{1}{2}$ centimeters in length, developed on the right cheek, forming a defined elevated ring surrounded by a

¹ B. J. D., 221, 1899.

² B. J. D., 1894, pp. 1-3 (colored plate). See also the former, 1902, 61, 9, 219. B. J. D., 1906, xviii., 4, p. 140. Discussion of case of child four years, affected in two fingers of the right hand since eighth month.

³ Annales Jan., 1904; Bury, *Ild. Med. News*, May 18, 1889, p. 145.

⁴ *Ild. Clin. Surgery*, i., 1878, p. 39.

⁵ Reprint, Royal Society of Med., July, 1908. Analysis of 49 cases, 21 figures, and bibliography.

⁶ *Archiv*, 1907, t. lxxxvi., p. 257.

reddish areola which appears to be an instance of this disorder occurring in an adult.

Pathology.—The histological changes recognized by Audry included acanthosis of the rete and, deeply situated in the corium, disseminated lesions with perivascular inflammation. There were plasma cells and nuclear débris in the connective tissue, some of whose fibres were sclerotic; the elastin had disappeared. There were four times as many eosinophiles as polynuclear cells; the blood-cells were unchanged.

In the analysis of Little's cases the rete at first seemed to be unimpaired but deeply placed in the corium and near the hypoderm, nodules were recognized where cell-infiltration affected the dilated sweat-coils. More closely examined, large mononuclear cells, others spindle-shaped or pear-shaped, and some "epithelioid" and mast-cells were to be seen. In other cases yet the cells seemed to be arranged in clumps surrounded by connective and elastic tissue, following the course of the vessels in long, vertical and horizontal rows. In some of these nodules there was central necrosis. In many of the cases there was a deep hypodermic inflammatory process spreading toward the surface.

Treatment.—It seems clear that in the course of time many of these lesions disappear spontaneously. Salicylated ointments and pastes with or without the use of ichthyol or resorcin have proved efficient. Jadassohn employs arsenic internally. In many cases without doubt children exhibiting these symptoms require supporting treatment.

URTICARIA.

(Lat., *urtica*, the nettle.)

(HIVES, NETTLE-RASH. *Fr.*, ORTIE; *Ger.*, NESSELSUCHT, NESSELAUSSCHLAG.)

Urticaria is an affection of the skin, the chief characteristic of which is the sudden appearance of ephemeral lesions termed wheals.

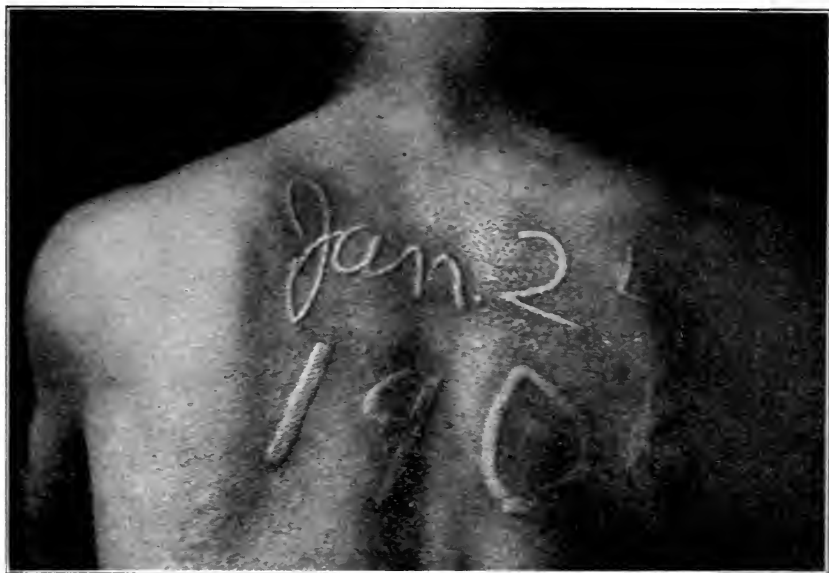
A wheal is a sudden and ephemeral circumscribed exudation of fluid into the derma and subcutaneous tissue producing porcelain-like or rosy-tinted flat, elevated areas and accompanied by itching or a stinging sensation.

Symptoms.—This disorder may be ushered in by constitutional symptoms, such as inappetence, malaise, cephalalgia, or mild pyrexia phenomena lasting for a few hours or even a day or more.

With, and often without, such prodromic symptoms the eruption suddenly appears in the form of wheals upon the skin-surface, that frequently disappear with equal rapidity, leaving no trace of their existence save a slight and transitory hyperæmia of the affected spot. The lesions may be as small as a finger-nail or a coffee-bean, and usually are of this size; but in rare instances "giant"-wheals are seen—large tomato-sized projections or flat elevations of broad areas

of the integument, that cover the greater part of the belly or buttock. In color the lesions are rosy-red or whitish, and are usually surrounded by a hyperæmic areola. They may be isolated and few, or be numerous and closely packed together; they may even coalesce, so that individual wheals are scarcely recognizable. They are usually firm and semisolid to the touch. Rarely, the horny layer of the skin is raised in fluid-containing lesions by the sudden effusion of serum beneath. In contour they are roundish or oval-shaped, but a variety of curious outlines may result from the irregularity of their development. Concentric circles, lines, bands, and even figures are in this

FIG. 38.



Dermographism.

way produced. The finger-nail drawn across the unaffected portions of the skin of a patient with urticaria will often produce a linear wheal ("urticarial autogram") of extent corresponding with the line of irritation (dermographism). In this way the so-called "medium" with a sensitive skin exhibits written characters upon the surface of his body.

The subjective sensations induced by these lesions are distressing in varying degrees, according to the susceptibility of the individual. Every grade of pruritic burning, tickling, crawling, pricking, and especially stinging sensations, is thus engendered. The efforts of the patient to secure relief by scratching not only serve still further to develop the eruption, but also to irritate, tear, and otherwise wound the lesions already in full evolution. In this way serous effusions are produced at the summits of the wheals; and in this way, also, lesions really transitory in their course may be changed to more persistent,

deeply colored, flat, lenticular papules. Where the skin is delicate and thin, as is that of the lids and prepuce, considerable œdema may result.

All parts of the body may become affected. The disease occasionally involves the mucous membrane of the mouth, pharynx, and larynx.

The lesions numerically may be few or be so numerous as to cover the entire surface of the body. Though more frequently acute in course, they often recur from apparently insignificant causes, or even become chronic. In many cases apparently trivial the disease may become so aggravated as to make the largest demands upon the skill of the physician.

The rapidity of appearance and disappearance of the lesions visible upon the skin is a characteristic feature of the disease. In some instances but a few moments are required after the operation of an efficient cause to develop a large number of closely packed wheals. Even while they are under inspection it can be noted that there is a change in individual lesions, some fading or completely disappearing, while others are newly developing.

A number of names have been employed to designate the several external peculiarities of the lesions as they are presented to the eye. Thus, *Urticaria annularis* occurs in rings; *U. figurata*, in gyrations from union of several lesions or patches of lesions; *U. vesiculosa* and *U. bullosa*, where there is a vesicular or bullous development at the summit of the lesion; *U. papulosa* (or *Lichen urticatus*), where there is a combination of the features of the wheal and the papule, the lesions being grape-seed- to coffee-bean-sized, and covered with blood-crusts where their apices have been torn in scratching; *U. tuberosa*, where "giant"-wheals occur, some attaining the size of a hen's egg; *U. hæmorrhagica* (*Purpura urticata*), where the urticarial element is developed in a lesion produced by cutaneous hemorrhage; and *U. evanida* and *perstans*, where there is, respectively, a rapid or a slow process of involution in the characteristic symptoms.

Baker¹ reported a case of *Urticaria Tuberosa* characterized by the presence in various parts of the body, of persistent yellowish-red tubercles which proceeded to ulceration. The parts most affected were the knuckles, the elbows, and the ear. These tubercles are said to have begun in a manner similar to that which characterizes the onset of evanescent urticarial wheals and tubercles. A somewhat similar case was observed by McCall Anderson.²

Urticaria, like erythema, may be either idiopathic or symptomatic; and in each form the urticarial conditions may underlie or be superimposed upon almost every elementary lesion noted in the integument. The wheal may complicate (or be complicated by) the macule, papule, tubercle, vesicle, bulla, and pustule. It may spring from an excoriation or may result in a fissure. It is common in traumatism, and is a prominent symptom in the skin bitten by insects, reptiles, or domestic animals.

¹ *Lancet*, August, 1881, i., p. 153.

² *Brit. Med. Jour.*, 1883, i., p. 1103.

Urticaria in Infants and Young Children (Fox¹).—The urticarial wheal in early life consists of a hard, pointed, pin-head-sized papule surrounded by a small-coin-sized areola of redness. This lesion may occasionally be seen in adult life. The redness may disappear leaving the papules, or the papule may be capped with a vesicle which gradually increases in size and becomes umbilicated producing the so-called "Varicella Prurigo." The urticarial wheal of adult life is less common in little children.

LICHEN-STROPHULUS AND PRURIGO² is a form of infantile urticaria occurring especially on the extensor extremities of infants and young children, which is frequently described as a form of prurigo.³ It is usually mistaken for scabies.

The ordinary urticarial wheal, occurring in children from six to twelve years of age, sometimes leaves pigmentations and occasionally pitted scars.

Chronic Urticaria.⁴—There are two forms of chronic urticaria: *urticaria recidiva*, in which new wheals, of the usual type, are constantly appearing during a long period of time, and *urticaria perstans* (tuberosis cutis pruriginosa,⁵ acne urtica⁶) varieties of urticaria in which pigmentations, nodules, verrucous and lichen planus-like lesions dominate the clinical picture. In these forms urticarial wheals are frequently absent when the case comes under observation, which renders the diagnosis a matter of great difficulty.

Etiology.—Idiopathic urticaria always results from the action of external irritants, prominent among which are the bites or stings of mosquitoes, lice, fleas, bedbugs, gnats, wasps, caterpillars, and bees. The irritant action of the nettle (*Urtica urens* and *U. dioica*) has given the malady its name. Contact with certain species of the jelly-fish is also effective. The wounds thus inflicted usually give rise to a stinging or a burning sensation, by which the patient is excited to rub or scratch the part. A wheal is rapidly formed at the site of the injury, and the irritation set up is conveyed to other parts of the skin in the vicinity, so that, especially in children, a single traumatism by an insect may excite an urticaria covering a much larger area. Many medicaments operate similarly, and it should be added that all the external agencies which are capable of irritating the skin, though applied without toxic effect to the mass of men, may produce urticaria in individuals predisposed to the disease, or having a peculiar intolerance for a particular substance. Thus, a common flaxseed poultice when made to cover but a small portion of the body has produced violent symptoms of urticaria. Climatic influences, more particularly those in which the surface of the body is exposed to cold air, are efficient in the production of urticaria, as

¹ Monatshefte, 1890, vol. 10, p. 526.

² Henoch, Vorlesungen ueber Kinderkrankheiten, 1887, p. 829.

³ La Pratique Dermatologique, vol. 4, p. 74.

⁴ Archiv, vol. 48, p. 163.

⁵ Archiv, vol. 81, p. 208.

⁶ Ikonographia Dermatologica, Fasc. 1, Tab. II.

also of bronchial asthma, with the symptoms of which the disease under consideration, in the case of adults, may often coexist or alternate. Mechanical violence, the application of leeches to the skin-surface, and surgical traumatisms may also act as exciting causes.

Symptomatic urticaria is chiefly of the variety named by authors *ab ingestis*, since it most frequently results from medicinal or from dietary articles taken into the stomach. Of the latter class may be named eggs, cheese, pork, sausage, coffee, tea, cocoa, confectionery, crabs, lobsters, clams, caviar (and several species of fish-roe), oysters, and fish generally, strawberries, cucumbers, skins of grapes, nuts, dates, raisins, almonds, figs, prunes, gooseberries, raspberries, canned ("tinned") fruits, meats, vegetables, oatmeal, pease, beans, onions, garlic, "corn," pickles, sauces, honey, mushrooms, pastry, salads, and spinach. Vinegar, champagne, beer, and alcoholic beverages in general are capable of inducing a similar effect.

Among the medicinal articles capable of inducing urticaria may be named the balsams, the turpentine, quinine, glycerin, chloral, valerian, arsenic, hyoscyamus, cinchonidine, salicylic acid and the salicylates, senna, santonin, opium and its alkaloids, and the various vaccines including the antitoxins.

In the case of children and infants a severe urticarial efflorescence may be provoked by worms, or by any undigested morsel of food, or indigestible material of any sort that may have been passed into the stomach. Thus, a bit of orange-peel or a fragment of potato-paring or the skins of grapes may be discovered to lie at the root of the trouble. In the case of adults, also, who have experienced repeated attacks of urticaria, and suffer from sensitiveness of the gastro-intestinal tract, any food not easily digested by a given individual may induce in him a return of the disagreeable symptoms.

This undue sensitiveness to the effect of ingesta or of external irritants is often an idiosyncrasy peculiar to the individual either on special occasions or at all times, and, given this susceptibility, the effect is often great with a relatively insignificant etiological factor. Thus, a teaspoonful of beer, one grain of quinine, the smallest fragment of cheese, or but a single strawberry, may not only induce an urticarial rash of such extent as to cover the greater part of the surface of the body, but will also do the same on every occasion when the articles named are swallowed in the quantities given. The fact that a small quantity of the article ingested can produce urticaria is important, because it emphasizes the general characteristics of the medicamentous eruptions. The *a priori* reasoning, that the greater the quantity of the toxic agent applied or swallowed, the graver the effect, may lead to gross errors. It should be remembered, in seeking the explanation for an urticarial rash that the smallest amount of apparently innocent substances may be responsible for the largest annoyance. In exceptional cases the mere odors of iodoform, linseed, liquorice, certain plants, etc., have been sufficient to cause an attack of urticaria.

Other causes of urticaria may be cited, such as moral emotions (fear, shame, anger); pulmonary diseases, especially asthma; gastrointestinal disorders, in which ingesta play no part; intestinal parasites; malaria; the exanthematous fevers, particularly in their prodromal stages; disorders of the uterus, the kidneys, and the nervous centres; dentition, pregnancy, and the irregularities attending the menopause; and, lastly, the following special diseases: pemphigus, prurigo (of Hebra), rheumatism, and purpura.

The close affinity of urticaria with acute circumscribed œdema, purpura, and erythema multiforme is discussed with the diseases last-named.

Pathology.—Urticaria usually is classed as a vasomotor neurosis. The wheal is a sharply circumscribed œdema, and is produced apparently by an interchange of play between blood-vessels, muscles, nerves, and tissue, under the operation of a principle which the French term *choc en retour*. There is, first, under the influence of the vasomotor nerves, a clonic spasm of the arterioles in a limited area of the derma, by which is produced an acute œdema with serous exudate. The rapidity with which this clonus occurs is greater than that with which the tissues of the vicinage can accommodate themselves to it, either by imbibition or more diffuse tumefaction, and there results a counterpressure upon the affected capillaries, by which their lumen is still further restricted. As the wheal is not a purely fluid-containing nor yet an entirely solid lesion, but is semifluid in consistency, the mechanical pressure is greatest at its centre and least at its periphery. Thus are explained the white and relatively bloodless appearance of the centre of certain wheals, and their rosy or reddened outer border. The explanation is strengthened by the fact that generally the most acute lesions, those springing into view most rapidly, are chiefly characterized by this whitened centre, while those more indolent or even chronic in their career, having been less subject to the interplay of the forces described above, permit of more general vascular injection, and have a light-crimson or even at times a dull-red centre. Wheals have been excised and microscopically examined by Neumann, Vidal, Poncet, Unna, and others, with the result of discovering merely evidence of dilatation and engorgement of blood- and lymph-vessels. The deep vascular net shows the greatest dilatation of lymph-channels. The compression of the blood-capillaries produces the whiteness of the acutely developed wheal. According to Poncet, the lymph-vessels are also choked with "lymph-clots." Rohé¹ explains the occurrence of the wheal by supposing that certain sensitive nerve-fibres of the skin possess also a vaso-motor function.

Unna believes the wheal is produced by a spastic contraction of the veins. Gilchrist² found in the lesions of urticaria factitia of but

¹ Maryland Med. Jour., 1881, viii., p. 25.

² Johns Hopkins Hosp. Bull., 1896, vii., p. 140. See also Trans. VI, Int. Derm. Congress, 1907, pp. 905-6.

a few minutes' duration an increase in the number of round cells and of polymorphonuclear leucocytes, and other evidences of true inflammation. Török¹ also finds in urticaria evidence of simple inflammation. Török and Hári,² and Phillippon³ as a result of numerous experiments conclude that urticaria, also the oedema which is present, is due to the direct action of an irritant upon the vessels at the point where the cutaneous lesions are produced, and that the disorder is not therefore an angio-neurosis. Toxines may reach the vessels from within or from without.

Diagnosis.—The diagnosis of classical urticaria is so readily made that the disease is often recognized before the attention of a physician is called to it. As usual, the atypical cases are those in which confusion may arise. The chief points to be remembered are: the rapidity of evolution of symptoms, their ephemeral duration, and the characteristic sensations they awaken. The action of the animal parasites and of insects not parasitic should not be overlooked, and the rash should be closely examined for the minute wounds inflicted in this way, often covered with a minute pin-point- to pinhead-sized dried "blood-scale," and usually found in groups of two, three, or more lesions. The various forms of erythema papulatum, tuberculatum, and nodosum may be mistaken for urticaria; but this is in many cases inevitable, as intermediate forms between the two disorders are with difficulty assigned to either category. Absence of marked subjective sensations and persistence of lesions generally point to an erythema, while marked prevalence of these symptoms would probably decide in favor of urticarial disease.

In many cases the physician is consulted by a patient who gives a history of well-nigh intolerable distress at night or at other capriciously selected hours, and who repeatedly and vainly endeavors to exhibit the lesions as they appear upon the skin. Being examined on various occasions, scarcely a trace of cutaneous disorder is manifest. Here the practitioner has actually to decide upon the character of an eruption he never sees; the task is rarely difficult, no other than the urticarial eruption behaving in this fashion. Occasionally delicate, rosy or deeper stained mottlings of the skin-surface remain where the wheals have been. At times also on the flexor aspect of the forearm, or in some situation in which the skin is equally delicate, one or more typical lesions may be produced by the aid of a fingernail in scratching, or by rubbing. These cases are frequently of the chronic or at least of the relapsing class, and the victims of the disease may have a characteristic facies, a worn look from loss of sleep or from mental emotion. In this class often are those who mourn the death of relatives, the loss of property, or separation from home and friends, and those harassed by anxieties.

The several lesions of erythema are larger than those of urticaria, and they do not develop from characteristic wheals; in erythema mul-

¹ Archiv, 1900, liii., p. 243.

² Ibid., 1903, lxx., p. 21.

³ Ibid., p. 387.

tiforme the lesions are far more persistent in type and do not provoke the characteristic subjective sensations of urticaria; in erysipelas the redness is characteristic and the swelling more diffuse.

Treatment.—Many cases of acute urticaria demand no treatment. The physician is summoned for a diagnosis. The patient and his friends are alarmed by the dread of variola or other severe affection, and learning that perhaps a pickled cucumber is alone responsible for the disorder, they wait with equanimity for the favorable conclusion which is always reached. Fortunately, the unusual, severe, and relapsing forms rarely begin with acute symptoms.

Naturally, the first indication to be observed is the removal of the cause, and with this, if possible, accomplished, the next is the exclusion of all aggravating agencies. The discovery of the cause, at times readily affected, is often the most serious problem presented. An exhaustive and minute examination of the person and the history of the patient, a study of his food, drink, medicine, régime, clothing, sleeping-apartment, habits, occupations of life, and mental state, are here essential. When the disorder is recent, and is an *urticaria ab ingestis*, a brisk emetic or a cathartic may rid the stomach or the bowels of offending matters. This done, it should be borne in mind that an idiosyncrasy of the patient may at this moment render the skin peculiarly sensitive to the action of other ingesta, and the diet, for a few days certainly, should be prescribed carefully. In many cases the alkalies are indicated by an acid condition of the stomach, and then the preparations of sodium, potassium, or magnesium are useful. Laxatives, such as rhubarb, magnesia, the cathartic mineral waters, and, in the case of children, small doses of castor-oil are frequently indicated when there is no suspicion of irritating ingesta. At other times there is marked atony of the digestive organs, when the mineral acids, the bitters, and the ferruginous tonics may be needed. Again, lactopeptin, pepsin, or bismuth subcarbonate or subnitrate may be exhibited with advantage for the relief of the indigestion which may be the prominent feature of the attack.

Other remedies found useful in the internal treatment of urticaria are sulphurous acid in 1 drachm (4.) doses three times daily in sweetened water (Da Costa); copaiba; sodium nitrite (J. P. Sawyer); strychnine (Guibout); sodium arsenate, employed by Blondeau in doses of from $\frac{1}{30}$ (0.002) to $\frac{1}{50}$ (0.0013) of a grain; the fluid extract of ergot in $\frac{1}{2}$ drachm (2.) doses (Morrow); atropine sulphate in doses of $\frac{1}{60}$ (0.001) of a grain (Schwimmer); and sodium salicylate in scruple (1.33) doses. The latter drug has been praised highly by a number of writers. It is often given in 1 grain (0.06) doses every hour. Pilocarpine, or the fluid extract of jaborandi, is known to produce at times a powerful effect in relieving surface-congestions of the skin by means of the hyperidrosis it occasions; and in proportion as the sweating is produced the drug may become dangerous.

Schwimmer endorses the following formula for this affection;

℞ Atropinæ sulph.,	gr. $\frac{1}{2}$;	0 01 ⁻
Aq. dest., }	āā 3ss;	2
Glycerin., }		
Gum. tragacanth.,	q.s.	M.
Ft. pil. No. xx.		

The treatment of symptomatic urticaria should have regard also to that disorder of the viscera or of the general system to which the cutaneous symptoms may be attributed. Gout, as a not infrequent cause of the disease, should not be forgotten in advising treatment. The woman with uterine disorder may require appropriate medication, as also a patient affected with diabetes. Quinine is indicated, of course, in periodical attacks, but its action in exceptional cases as a direct cause of urticaria should not be overlooked; the same, to a greater extent, is true of arsenic, potassium bromide and iodide, chloral hydrate, and gelsemium. The larger number of patients are best treated without the employment of these drugs.

In the local treatment of urticaria protection of the sensitive skin from all sources of external irritation is the chief object. The complete covering of an affected region with absorbent cotton will often cause a rapid disappearance of the symptoms. Individual lesions which are sealed with collodion or plaster usually disappear promptly. The zinc-oxide adhesive plaster is very serviceable, as it does not irritate the skin. The patient's underclothing should be of soft linen, cotton, or silk, and to prevent friction with the skin a dusting-powder may be used freely, both on the skin and in the meshes of the underwear. Sleep should be secured without an excess of bed-covering, and places where the temperature is for any reason elevated should be carefully avoided by the patient, such as proximity to a fireplace or a droplight, heated places of amusement, the kitchen, etc.

Great diversity exists in the methods employed to assuage the disagreeable sensations experienced in the skin. This diversity is explained by the varying results obtained in different patients after the application of the same medicinal agent. Thus: cold and hot water-baths; baths medicated by marine salt; aromatic vinegar; alcohol; cologne; camphor; the alkalies; and sulphuric ether (compresses dipped in such solutions and laid over the part affected); douches; and vapor baths will, any of them, in the case of some individuals, produce a marked alleviation of symptoms, and in others will be either inoperative or actually serve to aggravate the symptoms in the highest degree. Hebra asserts that several of the baths named above are useless, while Kaposi recommends cold lotions medicated with aromatic volatile substances. Fox prefers that alcohol, or cologne-water to which benzoic acid has been added, be dabbed over the part and permitted to evaporate. Solutions of menthol in alcohol and water, 1 part to 500 or 600, operate similarly. Hillairet and Gaucher employ in a similar way a solution consisting of one-third of ether and two-thirds of warm water.

The alkaline bath should contain sodium carbonate, sodium bibor-

ate, alum, or potassium bicarbonate, either singly or in combination in the strength of about 6 ounces (180.) of the salt to 30 gallons of water; 1 or 2 ounces (30.-60.) of potassium sulphuret may be substituted. The water is made demulcent by the addition of starch or of gelatin, or by immersing in it a muslin bag containing bran. When it is desired to employ the acid bath, $\frac{1}{2}$ ounce (15.) of either muriatic or nitric acid is added to the quantity of water given above. The bath of this size may also be medicated with 1 drachm (4.) of corrosive sublimate; or this drug may be used as a lotion in the strength of from $\frac{1}{4}$ (0.016) to $\frac{1}{2}$ (0.033) grain to the pint (500.). Carbolic, benzoic, salicylic, boric, dilute hydrocyanic, and dilute nitric acids in weak solution are also employed with advantage in some cases.

Other external applications are thymol, ammonium carbonate, potassium bromide, ether, chloroform, or chloral-camphor in the strength of $\frac{1}{2}$ to 1 drachm (2.-4.) to the ounce (30.) of ointment. This substance is prepared by rubbing together equal parts of camphor and chloral until a semiliquid results. The preparation is an antipruritic remedy of value, but if not largely diluted will increase the uneasy sensations produced. In other cases an oily or fatty substance will give more prompt relief, especially if the eruption has been irritated by scratching and tends to persist. Among useful applications may be named the linimentum calcis of the pharmacopœia, and cold-cream salve, to which may be added fluid extract of *grindelia robusta*, 1 part to 20 or 30 of vehicle; also the dusting-powders, which are described in the chapters relating to General Therapeutics and the Erythemata. These powders are the most cleanly of all external preparations in urticaria, and are often the only local measures required. Among the Germans, sulphur, naphthol, and tar-salves are employed in the management of the disease.

One of the most effective and trustworthy of local applications in severe urticaria is a starch solution. The starch is first mixed with cold water, and is then boiled until the solution is of the consistency of thin mucilage. To each pint of this 1 drachm (4.) of zinc-oxide and 2 drachms (8.) of glycerin are added before ebullition is completed. When cool and applied to the surface this solution often gives prompt relief. The same is true of a thin solution of boiled oatmeal.

Such is the empirical treatment of urticaria. It is founded upon no rational method of procedure, because the very capriciousness of the disease demands and secures relief in one instance by a treatment which should be reversed in another. It must be admitted that cases occur in which all treatment seems absolutely valueless, often really injurious, to the patient. These cases will usually be found to be of the relapsing or chronic type. The subjects of this form of disease are often plunged into morbid mental states, dreading by day the exacerbations of the night, brooding over misfortunes experienced or anticipated, worn by loss of sleep, fearful of a generous régime

at the table. Here the treatment is largely moral, and demands the tact and courage of the physician. Travel, change of climate, variation in the routine of life, new social surroundings, and psychotherapy are here valuable. The widow must be made to lay aside the heavy crape-veil beneath which her urticaria plays; the solitary patient must secure an acceptable companion for a few hours each day.

It seems probable that to these efficient agencies must be in part ascribed the relief so often obtained at various mineral springs, both in America and abroad. Thus, the Karlsbad, Vichy, Saratoga, and White Sulphur Springs have all been credited with the production of beneficial effects in urticaria.

Prognosis.—The prognosis of an attack of urticaria is, as may be seen in what has preceded, exceedingly variable in different cases. Simple attacks of the acute sort are trivial, and in a few days the patient may retain but the slightest traces of the trouble. In the case of children the attack is often at an end in the course of twenty-four hours.

It should, however, never be forgotten that urticaria may torment the life of a patient to the utmost bounds of tolerance and seriously impair the general health. Persistent and rebellious chronic urticaria may prove to be a truly formidable affection.

URTICARIA PIGMENTOSA.

(XANTHELASMOIDEA, Fox¹.)

Symptoms.—This disorder, once regarded as an affection of great rarity, has now been recognized in almost all the large centres of population. The disease is characterized by the occurrence in early infancy, sometimes but a few hours or a few weeks after birth, of elevated, rosy or reddish, round or oval wheals and nodules, which are succeeded later by flattish or slightly elevated, light or dark-brownish or buff-colored macules. Exceptional cases are reported in which the disease made its first appearance a number of years after birth. There are three tolerably distinct types of the affection: those exhibiting plane lesions with equally flattened maculations; those with tubercular, nodular, or variously sized and shaped wheals; and mixed varieties, the latter being commonest. The mingling of a factitious urticaria with lesions long existing and long maculated is not rare. A characteristic feature of this form of urticaria is the tendency of the wheals to recur at the same site, and where pigmentation remains new wheals may be produced by irritation. Cases may be classified into those accompanied by itching and those not thus

¹ For complete bibliography, see Blumer, *Monatshefte*, 1902, xxxiv., p. 213, with review of clinical and pathological features of the disease; and Reiss, *ibid.*, 1903, xxxvii., p. 93; also Duhring's *Cutaneous Medicine*, vol. ii., p. 300; Wolf, Mraček's, *Handbuch*, vol. i., p. 599; Perrin, *La Patique Dermatologique*, vol. iv., p. 772; E. Graham Little, *B. J. D.*, xxvii., p. 447, and xxxiii., pp. 16 to 38, a thorough exposition of the subject with an appendix incorporating the recorded English, German, Austrian and French cases.

characterized; but these differences are due to accidental rather than to essential causes. The eruption, which at the outset may appear as late as the third year, commonly displays itself first on the neck and shoulders, and then rapidly spreads to the head and the extremities, eventually invading the entire body-surface—in well-marked cases even including the mucous membranes. The lesions are at first of the usual urticarial type, each with delicate zone, but soon lose their distinct contour and elevation, and become flatter and pigmented, the color in pronounced cases being a distinct yellow, deepening to a decided coffee-and-milk hue. After isolated tubercles once acquire the deeper tint they may persist for years; may return in crops; may even at times be commingled with bullæ which desiccate

FIG. 39.



Urticaria pigmentosa with xanthoma-like lesions.

in crusts; may form plaques of infiltration; may be covered with an erythematous blush due to hyperæmia of parts long affected; and, when itching is intense, may exhibit the general signs of the scratched skin. In a few of the reported cases the nodules were modified by vesicles and vesico-pustules, and were followed by whitish, instead of pigmented, spots in a smooth or wrinkled and scar-like skin.

Etiology.—The cause is unknown. Little¹ believes that inasmuch as uniform blood changes were found in his cases, the disease is probably a congenital blood disorder of the same class as hæmophilia, pernicious anæmia, and lymphadenoma.

Pathology.—Sections of tubercles have been made by numerous observers, including Unna, Raymond, Pick, Thin, and Gilchrist. Inflammatory changes similar to those of ordinary urticaria occur, but in addition the papillary layer is filled with mast-cells arranged in columns, a feature which is characteristic of the process. Brongersma² and Crocker found the accumulations of mast-cells and œdema throughout the cutis and extending into the subcutaneous tissue. In apparently normal areas adjoining the lesions Gilchrist and others found an unusual number of mast-cells in the corium. The epidermis is unchanged but for an accumulation of pigment in the basal layer of the rete.

Diagnosis.—Urticaria pigmentosa is to be distinguished from the slight pigmentation left after well-marked urticaria of later years by the beginning of the disease in infancy and by the persistent buff-colored tubercles. Xanthoma in all its forms is readily distinguished by its persistence in special regions, the eyelids, for example; by its first appearance in many patients at a later period of life than infancy; and by its characteristic chamois-leather-yellow shade.

Treatment.—No treatment has hitherto been so successful as to justify its recommendation. The internal remedies and local applications advised for urticaria have been employed with varying degrees of success. The best results are obtained after stimulating rather than soothing baths, at a later period of life than during the first six months. After such stimulation with salt and water or alcohol and water a boric-acid dusting-powder may be employed.

ANGIONEUROTIC ŒDEMA.

(GIANT URTICARIA.)

This form of urticaria was first described by Bannister.³ It is simply a special variety of urticaria. In ordinary urticaria it is not uncommon to observe a few giant-wheals, egg-sized and larger. In some cases where the patient has successive attacks the wheals may be of the giant variety in one attack; again, the patient may have successive attacks and exhibit only giant wheals.

Symptoms.—Giant-wheals are usually not very numerous and frequently they are single, sudden, ephemeral, egg- to fist-sized circumscribed œdematous swellings, affecting any part of the integument but exhibiting an especial predilection for the lips, eyelids, and scrotum. In some cases the patients complain of general pruritus accompanying the lesions. The tongue may be greatly swollen;

¹ B. J. D., 1906, p. 16.

² B. J. D., 1899, xi., p. 179 (with review of pathology).

³ Chicago Medical Review, June 20, 1880.

acute swelling of the pharynx may be mistaken for an abscess. Alarming dyspnoea may result where the œdema affects the larynx. Transitory stricture of the œsophagus has occurred. This form of acute circumscribed œdema may affect the brain in the diagnosis of which a history of repeated attacks of urticaria is important.

Circumscribed and Persistent Œdema of a single member or region of the body, not of the class of successive and repeated swellings noted above, is properly considered with the early stages of elephantiasis. It results most often from a localized lymphangitis or from so-called "recurrent erysipelas" (chronic eczema of the face, tumefaction of nose and cheeks due to obstruction by tumors of the antrum of Highmore), and appears upon the face usually as a smooth, shining, whitish or reddish tumefaction, ill defined as a rule, in a few cases with fairly good definition. The tuberculous toxines may be responsible for some cases. The swelling is usually of firm consistence, but can with some pressure be indented with the finger. It is always the seat of passive hyperæmia, never of active inflammation; but in the case of smokers of tobacco and hard drinkers an active inflammation is sometimes awakened. These patches are rarely painful or tender; advice is usually sought with a view to the relief of the consequent moderate deformity. The swellings occur as well upon the lower limbs and breasts of women. (Cf. Erysipelas perstans.)

Treatment.—Treatment is by frequent shampooings and embrocations, to stimulate the absorbents, aided by elastic compression. Facial deformities of this class are benefited by abstention from the use of tobacco and alcoholic stimulants, the diet at the same time being carefully regulated. The nasal cavity, the region of the orbit, and the mouth (caries of the teeth, etc.) should always be examined with a view to the removal of the cause.

PRURIGO.

(Lat., *prurire*, to itch.)

PRURIGO OF HEBRA, PRURIGO GRAVIS, PRURIGO FEROX, PRURIGO AGRIA, PRURIGO MITIS.

Prurigo is a chronic, exudative, cutaneous affection, commonly beginning in infancy or early childhood, continuing through life, and characterized at first by urticarial symptoms, later by the occurrence on the extensor surfaces of the extremities and also on the trunk, of minute, pale or reddish papules, accompanied with an intolerable pruritus.

Prurigo is one of those terms which in the past have led to considerable confusion in the nomenclature of cutaneous disease. In England chiefly it is applied with more or less looseness to disorders accompanied by the subjective sensation of itching, such as the prurigo mitis of Willan, and the disease well recognized under the title "pruritus."

The title "prurigo" in this connection is strictly limited to the disease to which the name was originally given by Hebra, a disorder beginning in earliest life and continuing throughout its duration. Once observed only or chiefly in Austria, it has now, in consequence of extensive immigration, been seen occasionally in America.

Symptoms.—The earliest symptoms are usually displayed in the latter portion of the first year of life, in the form of an urticarial rash, which persists and which is finally succeeded by typical papules of the disease. These papules are millet-seed- to hemp-seed-sized, in color not differing markedly from that of the normal skin. They are intensely pruritic, and rapidly become covered with blood-stained crusts in consequence of the induced scratching. As a result of this trauma there ensues a long train of complications, including pustulation, fissures, excoriations, dense infiltrations, crust-formation from exuded serum and dried blood, œdema, lichenification, and diffuse dark-brown pigmentation of the skin-surface in large areas. The glands which receive the lymphatic flow from the excoriated areas are enlarged. This adenopathy is conspicuously shown in the inguinal and cubital glands. Fully developed, the disease presents in general the same physiognomy in patients of different ages. The extremities always exhibit the severest manifestations of the disease, and of these the leg and forearm are usually affected more severely than the thigh and arm; though the trunk, the forehead, the neck, the face, and the scalp may also be involved. The extensor surfaces are invariably selected by the disease, while the flexor surfaces, such as the axillæ and the groins, except as regards adenopathy are free from change. The general health of the patient manifestly suffers from the insomnia and nervous agitation induced by the state of the integument. Emaciation, malnutrition, and cachexia are common sequels. The mental and moral tone of the patient thus harassed from early childhood throughout an entire life is necessarily profoundly impaired. Insanity and suicide are reckoned among its remote consequences.

Mild and severe forms of the disease are distinguished under the terms *Prurigo mitis*, *Prurigo ferox*, or *agria*; they agree with respect to the evolution of symptoms; the only difference to be observed is in their intensity. In the former the papules are fewer, the recrudescence rarer, the itching less intense, and the amenability to treatment more pronounced. While incessant and judicious treatment, climatic influences, and comfortable conditions of life are factors which mitigate the symptoms, the difference between the two forms is probably largely determined by the intensity of the causal elements which first establish the disease in the individual. A prurigo which begins with severe symptoms may persist in the ferox form throughout life; while a prurigo mitis is such from the first appearance of the disorder.

Etiology.—The disease occurs chiefly in Austria, few cases being recorded elsewhere. Wigglesworth, Campbell, Zeisler, and others

have reported cases in America. The actual cause of prurigo is not positively known. It is encountered more often in the male sex, is never contagious, and is never induced by lice; but, according to Hebra and Kaposi, it may be grafted upon an hereditary predisposition; several cases have been known to appear in one family, suggesting strongly an hereditary element. "Scrofula," tuberculosis, malnutrition, "misery," poverty, anæmia, and filth are held to be severally favorable to its development. The disease is practically limited to the poorer classes living under wretched hygienic and social conditions. Some authorities, especially among the French, hold that the disease has a neurotic base; that the pruritus is the essential element, the papules developing from the irritation of scratching. Others believe that a toxic cause operates, because of the urticaria at the beginning and the frequency of stomach and bowel disturbances in those who are afflicted. It is highly probable that both theories have a more or less true relation to the etiology of the disease.¹

While typical prurigo ferox, as described by the Vienna school of authors, is of such rarity that probably less than a dozen cases have been reported in America, the opinion is gaining ground that the same disease with milder manifestations (prurigo mitis) is much more common here than has been believed. Patients with severe prurigo, treated by Hebra himself, have found their way to our clinic; they bore unmistakable symptoms of improvement after a residence in the United States. Almost every American expert has observed cases of milder type.

Pathology.—Kaposi practically admits that, striking as is the clinical portrait of this disease, its anatomical features are indistinguishable from severe forms of obstinate papular eczema, or from other forms of chronic dermatitis accompanied by hyperplasia. The microscope reveals proliferation and swelling of rete-cells, cell-infiltration and cedema of the papillæ, most marked around the vessels, and frequently dilated lymph-spaces. There is a scattered deposit of pigment in the corium, and many cutaneous muscles (erectores pilorum) are thickened and shortened. Holder² states that these muscles are not only hypertrophied but also are contracted, and that the papule has an urticarial basis.

Some authors contend that the papules are solely due to traumatism of the pruritic skin. Auspitz believes that the disease is in fact a sensori-motor neurosis without essential lesion. Riehl³ considers it as a chronic form of urticaria. Leloir and others find the prurigo-papule invariably resulting from a cystic degeneration of rete-cells, thus forming a cavity which at first contains clear serum with the addition later of epithelial débris. The walls of the cyst later undergo keratinization.

Bernhardt,⁴ after studying a typical case in a patient with a para-

¹ Cf. Matzenauer, Mraček's Handbuch, Bd. ii., pp. 701-714 (with bibliography).

² J. C. D., 1901, xix., p. 489.

³ Vierteljahr., 1884, xl., p. 41.

⁴ Archiv, 1901, lvii., p. 175 (bibliography).

lyzed arm, believes the disease is a dystrophy of the corium due to chronic irritation of the trophic centres, and that the papule precedes the pruritus.

White,¹ in a review of the subjects which sets forth the great diversity of opinion as to the nature and cause of prurigo, concludes: "I cannot go farther than accept the existence of a condition of early childhood, allied to pruritus and urticaria in its visible manifestations, and not to be distinguished positively from them in its first stages, often becoming in certain parts of the world a chronic affection due to some inexplicable national cutaneous traits, or inherent customs of living; a condition which certainly lacks many of the essential elements of individuality."

Diagnosis.—Remembering the extreme rarity of prurigo in America it is to be distinguished chiefly from the various forms of papular eczema by the location of its lesions, by the course of the disease, by the age of the patient when it is first developed, by the great extent of the eruption, and by the uniform type of its lesions. In prurigo, also, the fingers and the toes, the flexor aspects of the extremities, and the face are more or less spared. Under treatment eczema commonly yields at least in some portions of the skin, while prurigo does not.

From pruritus, prurigo is readily diagnosticated by its general physiognomy and history, by its peculiar pigmentations and infiltrations, and by the special region chiefly affected. But both diseases may complicate prurigo, especially eczema, which is then ordinarily of artificial origin. In pediculosis corporis the parasites usually will be found upon the underclothing, while the lesions induced by the finger-nails never form closely packed papules. There is something highly characteristic in the widely separated excoriations, the puncta from wounds inflicted by parasites, and the inflamed papules seen upon louse-bitten patients.

In scabies the characteristic burrows of the parasites will usually be recognized, as also vesicular and pustular lesions. Urticaria can be mistaken for prurigo only in the earlier stage of the last-named disease.

Treatment.—In Vienna, sulphur, naphthol, tar, green soap, baths, and frequent anointings with oily and fatty substances have occasionally served to ameliorate the severe symptoms of the disease. Mercury, ichthyol, salicylic acid, carbolic acid, boric acid, and diachylon and zinc ointments may also be employed upon different portions of the skin when indicated.

The Wilkinson salve, representing a combination of tar, sulphur, and green soap, has proved of special value in many cases. Vleminkx's solution (*q. v.*), followed by hot bathing, and corrosive-sublimate baths, 1 drachm (4.) of the sublimate to 30 gallons of water, have also been recommended. Fox² reports a case relieved with sulphur and ichthyol ointments. Internally arsenic has proved valueless, while carbolic acid occasionally has seemed beneficial. Cod-liver

¹J. C. D., 1897, xv., p. 2 (with bibliography).

²J. C. D., 1903, xxi., 148-229.

oil and the ferruginous tonics with the bitters are indicated in many patients suffering from malnutrition. A generous diet and a tonic regimen are often essential to the management of the disease. It is to be noted of all cases that they are influenced happily by the warm weather of the summer season and by special attention to cleanliness and hygiene.

Prognosis.—The disease usually persists through life. The most favorable conditions are those in which the patient is young and surrounded by circumstances which permit of provision for his needs.

PRURIGO NODULARIS.¹

(MULTIPLE TUMORS OF THE SKIN ACCOMPANIED BY INTENSE PRURITUS—HARDAWAY; MULTIPLE TUMORS OF THE SKIN ASSOCIATED WITH PRURITUS—SCHAMBERG AND HIRSCHLER).

In the year 1880, Hardaway, of St. Louis, described this rare disease in a female patient under his care, a biopsical examination having been made by Heitzmann. In 1906, Schamberg and Hirschler described two cases of a similar character occurring in negroes. In July, 1908, the wife of a physician in a distant state was sent to me presenting the same features as those observed by the authors named above. These four cases seem to represent the only observations made respecting this rare and singular disorder.² The following description includes the chief features of the four cases:

Symptoms.—The patients were women, aged respectively 25, 40, 42, and 51 years; three married, the married patients had all been pregnant; all were fairly well nourished; two were in comfortable social circumstances; two were negresses.

The eruptive symptoms were firm, pea- to finger-nail-sized nodules occurring in great numbers on the back but chiefly over the extremities (hands, arms, feet—a few over the soles—legs, and thighs). The smaller were at first covered with a smooth envelope whitish, pinkish, or brownish (blackish on the negro-skin); as they grew older, they became rough, acquired a horny consistency, and often developed at the summit a suggestion of a verrucoid process. After scratching which was practiced in all cases, the surface of the nodules became furrowed, fissured, and at times hæmorrhagic. In some instances the nodules became fused in a plaque of infiltration;

¹ Bibliography: Hardaway, N. Y. Journ. of Derm., 1880, April; Trans. Am. Derm. Association, 1879, p. 78. Schamberg and Hirschler, J. C. D., 1906, April, xxiv., 151 (plate and four figures).

² Since these paragraphs were written, Dr. Jackson presented to the New York Dermatological Society, a woman, twenty-one years of age, who had been for ten years the subject of a disorder described as "multiple tumors associated with itching." This may have been an instance of prurigo nodularis. In the discussion, Dr. Johnston stated that the general appearance, behavior, and histological characters of the disorder justified its assignment to the prurigo group. (J. C. D., 1909, xxxiii., 39-40.)

in others they were isolated throughout. In one case they began as "blisters;" in all the others as dry papules.

In all four patients, though the tumors were neither tender nor painful, the itching was severe—in two of the severest grade—the others (negresses) were presumably less neurotic in temperament. The pruritus, limited to the lesions present, seems to be an essential feature of the disease. In point of fact, the four cases on record seem more exact counterparts of each other than is often recognized in clinical medicine.

Pathology.—The histology of the four cases is eminently alike. There is commonly, but not in all cases, thickening of the horny layer of the epidermis with fusiform cells apparent in the deeper strata. In the corium there are cell-nests and cell-columns spreading about the blood-vessels. These last are considerably enlarged. In some cases broad "horizontal trails" can be recognized in the sub-papillary layer.

Course.—The disease is of exceedingly slow career lasting from fifteen to twenty or more years. The itching was intense in two cases; in two it was less severe, both of these patients were negresses. My patient positively asserted that from the beginning, no single lesion after its full development had disappeared. In one case the lesions recurred after extirpation. That the nodules were not due in any way to scratching was made clear in Schamberg's and my cases.

Treatment.—The nature of this rare disorder is obscure and no treatment has yet been advocated as effective.

Prognosis.—The prognosis is in a high degree unfavorable, as regards the comfort of the patient.

ECZEMA.¹

(Gr., ἐκ ξέω, to boil forth.)

(Ger., ECZEM; Fr., ECZÉMA.)

Eczema is distinctly a protean disease. It is difficult, therefore, to define or describe it satisfactorily in a single paragraph. It is not only protean in its clinical manifestations, but its causes are varied, numerous, and usually complex. In histological detail different types of eczema vary considerably, yet all probably result from one common pathological process. Clinically, though a dozen successive cases of eczema may present wholly different pictures, yet they all have some characteristics in common and the diagnosis in most cases is not difficult. It has often been described as a catarrhal inflammation of the skin, but while it is true that as a rule eczema shows at

¹ For a complete presentation of the subject, with full bibliography, the reader is referred to the chapters on "Eczema," by Besnier, in *La Pratique Dermatologique*, t. ii., pp. 1 to 305, and by Unna, in *Mraček's Handbuch*, Bd. ii., pp. 169 to 393; also *Dühring's Cutaneous Medicine*, pt. ii., pp. 311 to 420.

some time in its history more or less serous discharge, either in vesication or in a denuded oozing surface, many cases of the erythematous or papular type persist as such throughout their entire course, and never produce an exudate upon the surface. Eczema cannot therefore, be regarded as invariably catarrhal in nature. The following definition seeks to embody, as adequately as possible, a proper conception of the scope and limits of the disease:

Eczema is an acute, subacute, or chronic dermatitis, beginning as an erythema, or by the appearance of isolated or grouped papules, vesicles, or pustules, occurring in uniform, multiform, or modified types upon a reddened, generally infiltrated base; accompanied by more or less intense itching and burning sensations; resulting in catarrhal symptoms and crusting, in infiltration and scaling; and leaving, after complete resolution, no cicatrices.

A vexed and unsettled question among dermatologists is the relation of eczema to other forms of dermatitis. The study of the exact pathological changes in the skin has led to the inclusion under eczema of conditions formerly considered distinct affections. On the other hand, many writers, especially in England and France, are now endeavoring to exclude from eczema every dermatitis for which a definite cause can be found. Eczema is a dermatitis, and it is not possible to say for every case which title is the more appropriate. A convenient, arbitrary division, which is followed in these pages, classes under dermatitis those forms of inflammation of the skin which result from recognized, external causes, and which subside on the removal of the cause. Such definite and independent affections as dermatitis herpetiformis or dermatitis repens are, of course, considered separately.

Symptoms.—Eczema is one of the diseases of the skin of most frequent occurrence. In the statistics gathered by medical men it would seem to rank first in the order of frequency, forming from 20 to 40 per cent. of dermatological cases reported. It is undoubtedly true that acne is a more common affection than eczema, but as many subjects of acne never deem it necessary to submit to treatment for its relief the records of such cases do not figure in dermatological statistics. This fact being noted, eczema may be regarded as the disease of the skin for which the practitioner of medicine is consulted most frequently. By as much as inflammation is the commonest accident of other organs of the body, by so much is its enveloping organ subject to the same pathological process.

The accepted signs of inflammation of any given tissue are usually named as increased heat, redness, pain, and swelling. These symptoms are present to some extent in every eczema though modified by the anatomical peculiarities of the organ in this case affected. The surface involved in typical eczema always shows some elevation of temperature, slight in chronic, but in acute cases possibly exceeding 105.5° F. (41° C.). Redness, varying in shade from the bright red of the acute to the dull red of the chronic forms, is a

feature of the eczematous skin. Pain here is represented by a sensation of itching which is almost invariably present and may vary from a slight annoyance to an almost intolerable distress. It is commonly intermittent or paroxysmal in character and is usually worse at night. In some instances, especially in acute and erythematous types, the sensation of burning or smarting may be more marked than that of itching. Occasionally an eczematous skin is hyperæsthetic and exceedingly sensitive to contact with even the blandest substances. The degree and character of the subjective sensations in eczema depend largely upon the location, type, or severity of the disease, but also to some extent upon the general condition or peculiarities of the individual. In acute types of eczema there is often some œdematous swelling, together with slight infiltration of the skin. In chronic forms the infiltration and thickening of the skin are more pronounced and may be excessive.

In addition to the symptoms of heat, redness, itching, or burning, and swelling or thickening of the skin, found in every case of eczema, the great majority of eczemas have certain characteristics in common. The course of the disease is capricious, not only the severity of the process, but often the type of lesion changing frequently and rapidly. This is most conspicuous in children and in others having delicate skins, and in those cases in which the affected areas are not protected from atmospheric and other external influences; it is unusual for eczema to pursue an even course. Daily variations in severity, with or without change or modification of type, are not uncommon. Apparent recovery is frequently followed by a relapse which may develop fully in a few hours and without apparent cause.

Aside from some cases of erythematous and papular eczema, which may persist throughout without change of type, eczema is notably a polymorphic disease, presenting in irregular succession or in varied combinations: erythema, papules, vesicles, pustules, crusts, scales, fissures, excoriations, or denuded and oozing surfaces. Even in the mildest cases the skin is slightly infiltrated, while in some severe, chronic forms the thickening may be excessive and deforming, or there may be hypertrophy of all the layers of the skin producing wart-like growths.

The serous discharge which is present during at least a part of the course of most eczemas is characteristic, and stiffens articles of clothing on which it dries. It may be imprisoned in vesicles, but more commonly oozes from a denuded surface or from minute excoriated points which represent abortive or ruptured vesicles.

Like all other inflammations, eczema may be acute or chronic. Like all others, too, the acute may precede, and the chronic may follow, or the reverse may occur. The disorder originating in sub-acute or insidious forms, may become chronic, and then, as the result of fresh or of more severe irritation, may develop the acutest symptoms. Frequently, as in the eczema of children, the disease may

be chronic in respect to duration, yet most of the time present acute symptoms. As a rule, eczema does not undergo spontaneous recovery, but tends rather to remain indefinitely and to extend either by involving contiguous surfaces or by developing in new areas. The disease is commonly more or less local, appearing in one or several irregular and usually ill-defined areas, but may be general or even universal. It apparently occurs independently of all other disorders, the general health remaining unaffected even in severe forms of the disease; or it may be the external expression of constitutional disturbance.

Clinically, several types of eczema can be recognized. These types require separate description. It should not be forgotten, however, that in the majority of cases eczema is a complex process, in which two or more types are seen, either in succession or simultaneously. Though several forms of eczema frequently coexist, it is usual for one type to predominate, either throughout the course of the disease or for certain periods.

Eczema Erythematosum is most common on the face, especially in individuals exposed to wind and weather or to direct heat, but it may appear on any part of the body, and is frequently seen on the palms, the soles, and in the genital regions. It begins usually as a diffuse, ill-defined area of redness, less frequently as a number of coin-sized macules or erythematous spots, which may coalesce or remain more or less distinct. Swelling and infiltration are present in varying degrees. In acute cases the œdema may be excessive, sometimes closing the eyes. In the subacute forms, which are the more common, there is less œdema and more infiltration and thickening of the skin.

The sensation of itching, which is so characteristic of most forms of eczema, is usually excessive, though it may be largely or wholly supplanted by one of heat or of burning. This is especially true when the process is acute in character. The color varies from a bright to a dull or purplish red, depending upon the severity of the disease, its location, and the peculiarities of the individual; and inasmuch as the condition is more frequently observed in middle-aged adults with darker hue of integument than in early life, the color of the part is often noticed to be of a dull-crimson shade. At times the coloration is irregularly distributed, producing a mottled appearance, bright at one point and dark at another. A yellowish tinge usually indicates that the process is combined with seborrhœa, producing the combination described in another chapter as dermatitis seborrhœica.

The erythematous surface is modified, as a rule, by more or less fine desquamation, which begins a few days after the occurrence of the first erythema, and persists to the end of the disease. There is no discharge, unless, as frequently happens, the type changes to a moist form; when the disease occurs on apposed surfaces, as in the axilla, under the breasts, or about the genitals, the superficial epider-

mis may be destroyed by maceration and friction, and leave a denuded, oozing surface. The disease may pursue an acute course, terminating in exfoliation and gradual resolution, or changing to the papular, vesicular, pustular, or mixed types. More frequently the process persists and becomes chronic. The skin then becomes more infiltrated and thickened, and may present voluminous firm folds, which are very conspicuous and often deforming. Exfoliation may be a pronounced feature. The area involved is frequently better defined than in other forms of eczema, and though the condition may remain limited to its original site for months or years, it has a decided tendency to extend either contiguously or by the formation of new areas. The intensity of the process may change frequently and rapidly. It is usually aggravated by exposure to heat, cold, or wind, or by any condition which favors congestion of the part. Scratching of the surface involved produces a change in the symptoms which the skilled eye will promptly recognize. Minute superficial losses of tissue are then visible here and there upon the surface; the more recent lesions having a reddened floor possibly hidden beneath a thin blood-scale, the older being surmounted by a light yellowish-red crust. The scratch-lines, often recognized elsewhere, are here less evident.

Like all other varieties of eczema, this form is extremely liable to recrudescence and relapse. In advanced life traces of the disease may be visible for years.

Eczema Papulosum.—Under this title are classed all those forms which have been described as *Lichen Simplex*, *Lichen Eczematodes*, *Eczema Lichenoides*, etc. In exceptional cases eczema may exist from first to last as a dry infiltration of the integument. There is perhaps no one of the various manifestations of the disease that is so frequently confounded with other widely different affections.

The papules are acuminate, pinhead-sized or larger, colored in various shades of red to a dark lurid shade, and are usually seated upon a reddened and thickened base. They are generally discrete, though often set closely together, are accompanied by an intense form of itching; and of all eczematous lesions are most likely to be irritated by scratching. Their summits are torn, often to such an extent as to bleed, the blood drying in minute crusts on the apices of individual lesions. Existing papules may persist for weeks or may disappear and be replaced by others. They may coalesce completely to form irregular, thickened, elevated, pea-sized or larger patches, covered with scales. The areas involved in papular eczema are often fairly well defined in outline. The extent of surface affected varies, the disease being in some cases largely diffused over several portions of the body, but it is usually limited to small single patches no larger than the size of a small coin. Such patches, covered with a single or with several groups of reddish papules, may continue to torment the patient for long periods of time, or, being at one time relieved, may recur with each aggravation of the malady by the exciting cause.

Papular eczema is a dry manifestation of the disease, and is thus most frequently noticed upon the drier portions of the integument. If the moist forms of eczema are most frequently seen in early life, it is none the less true that the dry forms are the most common in adult life or in advanced years.

The papules here described, when there is free exudation beneath the surface, may exhibit pin-point-sized vesicular summits which may develop into minute or larger pustules. A patch of papular eczema, where no vesiculation nor pustulation has been observed, will, if sufficiently scratched, ooze with moisture, the serum escaping from the

FIG. 40.



Eczema nuchæ (Lichenification).

abraded surface. There are, in fact, few scratched eczematous surfaces which will not moisten a handkerchief applied to the part. This weeping condition attracts the attention of patients themselves. A species of relief from pruritus is thus obtained; and in aggravated cases patients will scratch or rub or otherwise irritate the diseased patches, not merely for the purpose of gratifying the intense desire to assuage the itching, but also to induce serous exudation for the sake of the relief it affords.

Resolution of papular eczema is accomplished after the formation of scales, the tissues beneath the latter assuming more and more the appearance of healthy skin.

Eczema Vesiculosum is characterized at an early period by the formation of minute vesicles. It is a matter of importance, however, to recognize the fact that the vesicular, like the erythematous, is but one of several manifestations of this singularly protean affection. Long after the appearance of the treatises of early English dermatologists the term "eczema" was very generally limited by physicians to the vesicular phases of the disease; it is to the Vienna school that we are largely indebted for the recognition of the fact that these simultaneous or successive features, presented often in the same individual, really belong to one and the same malady.

The clinical features of vesicular eczema are chiefly due to the acuity of the inflammatory process present, and to the consequent free exudation of serum of the blood from the vascular plexus immediately below the *pars papillaris* of the corium. The involved surface usually feels at the outset hot, itchy, or unusually sensitive; and soon after becomes more or less intensely reddened, the result of hyperæmia and subsequent exudation which may last for one or for several hours. Poppy-seed- to grape-seed-sized vesicles then become visible on this reddened base. The lesions may be closely packed together, or be discrete, or may be so abundant as to coalesce, a frequent behavior of all vesicular lesions. Each vesicle is filled with a droplet of clear serum imprisoned beneath the most superficial layers of the epidermis. This vesicle is readily ruptured, and if this rupture does not speedily occur as the result of accident, the lesion bursts spontaneously, and its limpid contents are then poured out upon the surface of the integument. The quantity of the fluid thus exuded is in excess of that originally contained in the small vesicular chambers, due to the fact that the excoriated, macerated, and broken epidermis no longer presents an obstacle to the outflow of serum from the engorged vessels beneath. Minute and even large drops of a clear fluid of syrupy consistency can be seen collecting at the points where the solution of continuity has occurred. If with a slip of bibulous paper the first drop be removed, its place is visibly filled by a second. Crops of new vesicles succeed the first, each crop being followed by the train of symptoms described. The vesicles are usually short lived and often have disappeared before the patient is seen by the physician. In other instances the destruction of the epidermis by rubbing or scratching, or by an abundant and rapidly formed exudate, allows the escape of the fluid without previous vesicle-formation. The discharge dries rapidly, when exposed to the air, in light-yellowish crusts which are rarely bulky.

The contour of the affected patch or patches is seldom well defined, the pathological portions imperceptibly shading into the sound skin. The color of the area thus diseased varies according to the stage of the process, being at one time a vivid red, at another yellowish, and when covered with crusts or scales, undergoing a corresponding change of hue. Infiltration of the skin occurs rapidly, so that when a portion of the affected integument is pinched up between the finger

and thumb it is found to be thicker and less elastic than normal. This form of eczema may persist or recur in a single small area, or it may spread and become diffused or even generalized. It appears commonly on the flexor and other surfaces where the skin is thin.

The subjective symptoms of vesicular forms of eczema are more or less intense itching and often burning. In very acute forms there is considerable soreness, the patient managing the affected part with as much care as if it were a fractured limb. In exceptional cases, more frequently observed in children, there is sympathetic febrile disturbance of a mild grade.

As resolution approaches, all the symptoms described above gradually decline in severity; the serous discharge diminishes, the redness fades, the limits of the involved area become less distinct, the crusts loosen and fall, and beneath the scales which have taken the place of the oozing and broken epidermis a new and tender epithelial covering is produced. As a rule, for weeks after the process has completely ceased the newly formed epidermis has a slightly reddened and tender appearance, though complete resolution is followed by no permanent sequels. Instead of undergoing resolution the condition may terminate in eczema rubrum, in eczema squamosum, or in eczema pustulosum, this last form being ordinarily due to pus-infection.

Eczema Pustulosum (*Eczema Impetiginoides*, *Impetigo Eczematodes*).—This type may originate in one of the other forms of ec-

FIG. 41.



Eczema pustulosum (Infantile). (Fox.)

zema, in consequence of the severity or acuity of the process, or be the result of secondary pus-infection, or pustular lesions may rapidly form at the onset. Usually there is first seen a crop of minute vesicles, which enlarge and become distended with puriform contents. These pustules either accidentally or spontaneously burst, and the

fluid with which they were distended dries into yellowish-green or darker colored friable crusts. In aggravated cases the purulent matter seems to form directly upon the involved surface. If the process be long continued, infiltration occurs, and the itching, which in all varieties of the disorder is a characteristic feature, is awakened as an accompanying symptom. The itching, however, is rarely of the peculiarly aggravated type accompanying the erythematous and papular phases. Pustular eczema is most frequently encountered on the head, and in constitutions that do not readily resist the invasion of pus-cocci. When existing on the scalp and the face there is most com-

FIG. 42.



Eczema impetiginosum.

monly an involvement also of the sebaceous glands, the secretion of which, altered by the periglandular inflammation, is added to that naturally produced by the exudative process. Singular shades of mixed yellow and green and even black, are then to be distinguished in the resulting crusts, which later desiccate and fall, leaving a reddened and tender new epidermis beneath.

The four types of eczema considered above are, as has been stated, sometimes encountered in practice as distinct and unmingled forms of cutaneous disease, some of them more commonly than others. To pre-

sent, however, a picture of eczema as it is seen clinically it must be understood that these several forms, useful in the analytical study of the disease, often become, in actual observation, well-nigh inextricably commingled. "Observation of the natural course of an attack of eczema," said Hebra, "furnishes the most unassailable proof of the connection between its various forms. In one case an eruption of vesicles begins the series of symptoms; in another it is preceded by the appearance of red scaly patches or groups of papules; or vesicles and papules are developed together, some of the former rapidly chang-

FIG. 43.



Eczema pustulosum. (Fox.)

ing to pustules and forming yellow gum-like crusts by the drying up of their contents." It is this constant interchange of features that distinguishes most eczemas from all other inflammatory affections of the skin.

Eczema Rubrum.—This name has been given to the red and angry form of the disease, which, because of the free exudation of serum from the surface, has also been termed *Eczema Madidans*. In this form the highly inflamed, intensely red, and wounded integument, the horny layer of which has been destroyed and removed, pours out freely upon the surface a thick, gummy or syrupy fluid, which, if artificially removed, leaves behind it a swollen, angry, and still discharging skin; or, being permitted to dry where it has formed, covers the surface with large flake-like crusts, which may be thin and yellow, or thick, dark-colored, and often blood-stained. The crusts may remain but a few hours before an excessive outpouring of the fluid re-

moves them. There are thus displayed in frequent and rapid alternation the discharging and the crusted surface. Eczema rubrum may occur on any part of the body, but especially in the flexures of joints or where two surfaces are apposed; another common site is the legs of elderly people or of those who stand much of the time. In this region the disorder is exceedingly chronic and rebellious to treatment, and eventually is accompanied by a great degree of infiltration and thickening which may go on to hyperplasia and produce a condition simulating elephantiasis.

Eczema Squamosum (*Eczema Exfoliativum*) is marked by more or less redness, infiltration, and exfoliation of the skin. The scales are usually small, thin, whitish, and adherent. They may be scanty or quite abundant. Squamous eczema represents a low grade of inflammation, and is present as a transitory condition during a part of the period of resolution of all other types of the affection. It frequently persists, however, in the form of irregular, usually ill-defined, more or less infiltrated, dry, scaly patches. It is seen commonly on the neck and face, at the border of the scalp, and on the limbs.

Eczema Fissum (*Eczema Rhagadiforme*).—In eczema of the hand the movements of the fingers often produce fissures or cracks in the inflamed and infiltrated integument, and to those fissured forms the titles named above have been given. Fissures are observed wherever an eczematous disorder has so impaired the elasticity and extensibility of the skin that its necessary movements, especially about the joints, tear and stretch the thickened integument. It is thus seen not only on the hands, but also on the arms, the feet, and about the ankles, the resulting rhagades being, at times, the most painful of all the complications of the malady. It is seen frequently about the mouth and anus. Occurring upon the bodies and the hands of those who are compelled to come in contact with irritating substances, this form of the disease finds its severest expression. Mild, commingled forms of squamous and fissured eczema occur quite commonly on the hands and faces of persons whose skin is thin, tender, and poorly nourished, or exposed to wind, harsh soaps, hard water, chemicals, and other irritants. The condition is popularly known as *Chaps* or *Chapping*. In many instances these cases should properly be classed with *Dermatitis Traumatica* or *Venenata*.

Eczéma Craquelé.—This is a rare form of eczema described by French writers, in which a reddened surface is covered with large, thin flakes, or scales, separated and outlined in polygonal areas by superficial cracks or fissures. The condition usually involves a considerable surface of the skin, and is accompanied by itching and burning and in most cases by hyperæsthesia and an extreme sensitiveness to temperature-changes. It occurs chiefly in neurotic subjects.

Eczema Intertrigo is a name applied to that form of intertrigo which, surpassing the limits of hyperæmia, results in an exudative process. Reference is made to this possibility in describing the

symptoms of erythema intertrigo. In eczema intertrigo the symptoms are usually those of diffused redness of surfaces of the skin in close apposition, macerated by previous transudation of sweat, and weeping with the serum which oozes from several abraded points or patches. It chiefly attacks the obese of both sexes and all ages, and in advanced years the gouty.

The flexor surface of the extremities, especially in the vicinity of the joints, as well as the inframammary regions, the interdigital surfaces of the feet, and the axillary and inguinal spaces, are particularly prone to exhibit symptoms of this disease. In all such localities the alternate tension and relaxation of the integument serve, when the limbs are in motion, to increase the pruritus, and, correspondingly, to aggravate the disease. Often a certain proportion of symmetry can be perceived, the two popliteal spaces, for example, being simultaneously affected, though each in a different degree. The parts most favorable for the complications of intertrigo are those nearest the trunk, where moisture and heat are greater, as the groins and the axillæ, while the elbow and popliteal spaces are more frequently dry, exhibiting papulo-squamous ridges in lines at right angles to the axes of the limbs, with hyperæmic patches on either side.

Eczema Verrucosum, or the wart-like form of the malady, is occasionally observed, especially upon the lower extremities, in middle life or in advanced years, as the result of long-continued disease. The integument becomes thickened and so hypertrophied as to suggest the appearance of warts closely packed together in a circumscribed patch.

Eczema Sclerosum is most frequently observed upon the palmar and plantar surfaces, a condition referred to in the paragraphs relating to Asteatosis. In eczema sclerosum is presented a densely thickened inelastic integument, suggesting the condition of tanned leather, without the occurrence of any of the other lesions of eczema described above. As a consequence, perfect extension of the digits is impaired.

Tuberculous Eczema of Nurslings, so called, is a term which has been applied to eczematoid eruptions about the mucous orifices of the eyes, nose, mouth, and ears, occasioned and sustained by morbid conditions of, and serous discharges from, those parts (otorrhœa, rhinitis, phlyctenular keratitis, etc.), and accompanied by œdema, vesiculation, and enlargement of lymphatic glands. The disease is characterized by rebelliousness to treatment and chronicity of course. This disorder is improperly named, since tubercle-bacilli have not been recognized in its lesions; and because the symptoms above enumerated may all be present when there is simply systemic nutritive failure and when no tuberculosis of other organs is present.

Eczema Diabeticorum (*Fr., Diabétides*).—A singularly well-defined eczema is to be recognized about the genital organs of those suffering from persistent or even transitory glycosuria, due to the irritation produced by the passage over the parts, of urine charged with sugar. Women are often thus affected; and the condition is ac-

accompanied by the most atrocious pruritus, excoriations produced by scratching, and enormous tumefaction of the ano-genital and surrounding integument. The local symptoms are chiefly those of eczema erythematosum, the surface being, as a rule, destitute of either vesicles or pustules. There are often a profuse serous discharge, considerable infiltration, and the production of inflammatory nodules over the engorged surface.

FIG. 44.



Eczema orbiculare. (Howard Fox.)

Eczema Folliculorum.—Morris first described under this title a form of eczema which begins as an inflammation of hair-follicles. Each inflamed follicle projects from the surface in the form of a red-denied papule about which the skin becomes hyperæmic. As the process spreads centrifugally by the involvement of adjacent follicles, the centre undergoes involution with desquamation, and a gradual change in color from red to yellow. This condition is found most frequently on the extensor surfaces of the legs and the arms, in multiple, scattered patches. The itching may be intense. This form of eczema is obstinate, and usually recurs. Morris considers it parasitic in origin and allied to sycosis.

Eczema Parasiticum.—Under this title is included a large number of cases the exact relations of which to the recognized types of the disease are still indeterminate. It is well known, for example, that the surface of the human body in health is the habitat of an enormous number of different parasites which are, for the most part, harmless or are effective as agents of disease only under certain specially favorable conditions of the body. Cultivation-experiments with the flora found on the eczematous skin have revealed a large number of para-

sites which together, if not singly, may be effective in producing some of its distinctive features.

Eczema Marginatum is considered in the chapter descriptive of Ringworm.

Acute Eczema.—An acute attack of eczema may be ushered in by malaise, chilliness, or the recognized symptoms of the febrile state. With or without these prodromata the affected portion of the skin-surface becomes the seat of a burning sensation which is soon succeeded by redness and swelling. This tumefaction may occur upon one or upon several portions of the body at the same moment of time, and the disease throughout be limited to a single area or to several spaces; or it may extend from one to other or all regions. This extension may proceed by continuous development of the disease along the surface, or an eczema of the thigh may suddenly be followed by an eczema of the face, and this by an eczema of the scrotum. Extension of eczema by the last-described course may occur when no constitutional cause can be discovered and undoubtedly is due largely to the extraordinary sensitiveness of the skin when involved in an acute attack, in consequence of which the slightest irritation produces a new focus of the disease at a distant point. This consideration is of special importance. Patients will frequently point to an acute eczema upon several portions of the body widely separated one from another, and will urge this as an irrefutable argument in favor of the fact that they suffer from some “poison in the blood.”

The tumid and erythematous surface above described soon assumes the features of one or more of the types of eczema outlined in the preceding pages. In this manner the evolution of the disease occurs, and may continue for weeks, the patient, if unrelieved, being tormented by the itching, and, if the disease be extensive, being prevented from attending to his usual vocation. Acute eczema of severe grade will frequently prostrate a strong adult, confining him to his bed-chamber and often to his bed. When there is a simultaneous febrile process the emaciation and adynamia are proportioned to its severity. Weeks and even months may elapse before recovery can be pronounced complete, subacute patches of the disease lingering here and there upon the surface, crust-hidden, scale-covered, occasionally oozing from recrudescence of symptoms. Recovery, even when complete, leaves the patient, it should never be forgotten, with a skin sensitive to irritation and more prone to a fresh attack of the disease than one long virgin of an inflammatory process.

Such is the course of an attack of acute eczema of severe grade. It must be remembered, however, that the process may be mild and subacute from the beginning, or again that a circumscribed patch of skin may exhibit all the features of vesicular eczema in an acute form, and under the influence of appropriate treatment may be relieved satisfactorily in the course of a few days. Lastly, acute or subacute eczema may be followed by chronic forms of the disease, the one passing into stages of the other by scarcely definable gradations.

Chronic Eczema.—The symptoms and pathology of chronic eczema are largely those of the acute form of the disease. The chief differences to be noted relate to diminished intensity of the inflammatory action, a marked tendency to recurrence and persistence of the process, and a preponderance of scaling and infiltration as contrasted with the active secretion and crusting of acute phases. It is important, however, to remember that chronic eczema is not only the frequent sequel of such acute phases, but is prone also to recurrent exacerbations of acute grade, during which the serous discharges, consequent crusts, and angry aspect of the affected surface do not fail to reappear. The itching so characteristic of the malady in all its manifestations is often more annoying than in the acute phases of the disease.

Chronic eczema may involve a limited region of the skin, or may invade the entire surface of the body from the head to the feet. Rarely thus generally developed, it is more frequently observed upon circumscribed patches of the integument, as, for example, the scrotum or the flexor surface of a joint, in which situation it may linger for years or even for a lifetime, now better and now worse, or disappear for brief periods only to return with each recurrence of its cause.

Etiology.—The tendency in modern dermatology to regard eczema as a dermatitis without obvious cause, or one which persists after the withdrawal of a recognized irritant, necessarily places an increasing emphasis upon the importance of etiology. What are the elements which produce the cutaneous inflammation? or if a recognized cause has been removed, why does the dermatitis persist? The fact that eczema constitutes so large a proportion of reported skin diseases emphasizes the lack of knowledge of the factors which produce it, and the rapidity with which some of these conditions are assigned to other categories will be a measure of the progress of acquisition of etiological facts.

Some diversity of opinion exists among dermatologists as to the nature and pathogenesis of eczema. The views held have been grouped by McLeod¹ as follows:

(1) Parasitic: that eczema is produced by certain organisms acting upon the skin.

(2) Toxic: that eczema is the result of the action of irritants, operative externally or internally, in a susceptible individual.

(3) Neurotic: that nerve-strain or tropho-neurotic influences are the efficient cause.

(4) Cutaneous reaction: that eczema is a symptom merely; a response of the skin to irritants without or within.

It will be seen upon examination that these theories may practically be expressed in one, namely, the second. The view that eczema is due to the action of internal or external irritants in susceptible individuals is broad enough to include the others. Para-

¹ Practitioner, 1906, 77, p. 98. Gardiner makes a similar classification, Scott. Journ., 1904, November.

sites produce toxines which may act locally or from within after absorption; that nerve-action cannot be reduced to a final term, toxic action, has yet to be established; and the theory of cutaneous reaction necessarily presupposes a stimulus or irritant acting within or without.

Eczema is a disease of both sexes and all ages. It is not in itself hereditary, for no child was ever born into the world with eczema. A tendency to the disorder, however, may be transmitted from parent to child though not made manifest until adult life. The elements of this hereditary predisposition are not entirely certain. They are probably in part metabolic and for the present, until knowledge of the physical and chemical intricacies of the human organism is materially extended, they may be grouped under the rather general term, diathesis. The tendency to eczema is very commonly observed in those subject to manifestations of gout, and in those who suffer from asthma, both of which are regarded as diathetic disorders. It must be assumed also that congenital anatomical peculiarities of the skin may act as predisposing elements by increasing cutaneous vulnerability.

The question of acquired predisposition to eczema is intimately related to that of systemic irritation; in fact, the two are not separable. To the first may be assigned, in any given case, that proportion of the sum total of operative internal causes which expends itself in the reduction of the resistance of the skin, so that a slight irritant suffices to produce an eczematous attack. But this proportion is not a determinable quantity. Thus it is known that certain physiological states such as pregnancy or dentition, and many morbid conditions, predispose to eczema, but the eczema which develops is not due solely to the circulation of toxines within the body, nor does a definite proportion of this toxic cause reduce the resistance of the skin and the rest produce the eczema. For practical purposes all systemic causes, both predisposing and exciting, may be grouped together.

Eczema may occur in individuals who are in every respect superb examples of health; but in the majority of cases it is associated with some disturbance of the general economy; and it often occurs in persons who are affected with many forms of bodily ailment, both acute and chronic. By what means these varied systemic disorders favor the development of eczema is not positively known. Part of their association with the cutaneous disease may be considered as coincidence. In some instances they constitute conditions which favor the production of disease in general, eczema not excepted. Their direct influence in the production of eczema may be regarded as operating through the nervous, vascular, and glandular systems, upon the innervation, nutrition, secretion, and physiological growth and repair of the skin. The agencies by which this is accomplished may be considered toxic, whether they arise within the system from imperfect metabolism, or are developed as the result of microbic invasion or are formed by the degeneration of cell protoplasm.

The theory of reflex irritation has been called into service to explain the sudden appearance of secondary eczematous lesions at a distance from the original focus. The view holds that the inflammation of the skin is reflected from one place to another through the medium of the nervous system. A study of the elements which make up the inflammation complex seems to show that reflex nerve influence, without the aid of some toxic agency acting within the skin, cannot produce an eczema.¹ Cases which apparently lend support to the reflex theory can be fully explained by assuming, first, an unconscious transfer of an external irritant from the original site to other portions of the body; or secondly, a condition of systemic intoxication which operates by so reducing the resistance of the entire skin that a trifling irritation at any point is sufficient to produce an eczema; or thirdly, a lodgement within the skin, of an irritant, carried to the part by the circulation, or produced *in situ* through cell-degeneration resulting from trophoneurotic influences. Osillag's² experiments show that irritants applied to the skin produce a dermatitis at the area of contact, but in no other place, if care be taken to prevent accidental conveyance of the irritant to other regions. He holds that in four-fifths of all cases of acute eczema the cause can be shown to be an external agent, acting upon an oversensitive skin, and that lack of knowledge of the fact has led to the reflex theory.²

Among the conditions which are frequently associated with eczema, and which probably stand in causal relation to that disorder, may be mentioned the physiological states of pregnancy, lactation, and dentition; systemic derangements which depend upon defects in digestion, assimilation, and excretion; impairment of circulation, gout, rheumatism, diabetes, nephritis, asthma, disorders of the liver, anæmia, chlorosis, tuberculosis, and syphilis. The number might be extended to include all disorders which reduce the general vitality and therewith also that of the skin.

The external causes of eczema are identical with those of dermatitis, and are chemical, mechanical, thermal, or actinic in their action. As stated on a preceding page, no sharp distinction can be drawn between eczema and any other dermatitis due to external causes, but those forms of dermatitis which persist after the removal of the external cause are probably due in part to, and are continued through, the action of other etiological factors, and are conveniently classed with eczema. It is doubtful if any of the local causes of dermatitis, acting for a limited period, could produce a persisting eczema without the coöperation of other conditions, either internal or external. The large majority of all externally operating causes of dermatitis fail to be effective in the mass of individuals.

¹ Cf. McEwen, "The Relation of nerve impulse to cutaneous inflammation," J. A. M. A., 1906, xlvii, 8.

² Archiv, 1902, lxi, p. 213; and Orvosa Hetilap, 1906, 36; ref. in Monatsh., 1907, 44, p. 253. Cf. also Fordyce, Journ. Am. Med. Assn., 1903, June 13, p. 1621; and Pinkus, Med. Klinik, 1906, No. 9.

Respecting the numerous agencies operating thus externally and capable of producing the disease under consideration: they can all be referred to either solar light and heat, to contact with foreign bodies in various fluid or solid states, to toxic agencies of a widely differing nature, to traumatisms in varying degrees, and to the action of parasites. Many of these agencies coöperate, some include others, and some become effective by aggravating a disease which others have engendered. The reader is referred to the chapters on General Etiology and Dermatitis for fuller consideration of this subject. It will be sufficient to note here that acids, alkalies, antimonial and mercurial compounds, mustard, sulphur, castor-oil, capsicum, arnica, turpentine, chloroform, ether, alcohol, and a long list of other medicaments are capable, when applied to the skin, of producing a dermatitis that, in susceptible individuals, will persist after removal of the cause, and may therefore be classed as an eczema. The same statement is true of articles manipulated in many of the trades—those, for example, handled by the grocer, the baker, the confectioner, the seamstress, the ink-manufacturer, the mason, the cook, the gardener, the laundress, the painter, the dyer, the printer, the tobacconist, and the chemist. Then, too, the eczema of the person exposed to severe cold, or to intense solar light and heat aided by reflection from water, or even to excessive artificial heat, as the fire of a furnace, illustrates the action of other causes named. Pressure- and friction-effects are exhibited in the inflammatory effects produced by contact with shoes, the edges of cuffs, trusses, crutches, and corsets.

Scratching is a fruitful cause of the persistency of an eczema when the latter is well established. The experiments of Török¹ and Ròma² indicate that mechanical irritation of the normal skin, even in patients predisposed to the disease, will not produce a vesicular eczema, though in very sensitive skins a dermatitis with an exudate may result, and if the irritation be sufficiently prolonged, it may cause a lichenoid infiltration.

Water is capable of exercising an injurious effect upon the skin to the extent of producing an eczema when applied externally as a fluid in excessively cold or hot temperatures, or in the vapors of Turkish and Russian baths or if it be rendered irritating by saline or other constituents.

External causes of eczema are at times climatic, the disease being often worse during the cold seasons. Cold winds and sudden temperature-changes, especially from warm to cold, will often aggravate and prolong an existing eczema.³

The external sources of eczematous trouble named above should be regarded simply as suggestive illustrations. Every contact with the external world sufficiently severe or prolonged to awaken the resentment of the healthy skin may be followed by the protest of the

¹ Archiv, 1902, lxiii., p. 27.

² Ibid., p. 39.

³ Cf. references under General Etiology, p. 68; also Warde, B. J. D., 1903, xv., p. 349.

latter in the shape of an eczema; and the same may be true when even the most trivial external accidents occur to the sensitive skin of individuals especially prone to the disease.

That many eczemas are modified in their course, and that some are caused, wholly or in part, by various micro-organisms, is undoubtedly true. Aside from pus-cocci found in pustular eczema, however, no definite parasites have yet been demonstrated to be effective either in the production or in the modification of eczema. The healthy skin is the habitat of many forms of parasites, chiefly vegetable, and every skin-lesion is open to infection with any one of the many micro-organisms with which it may come in contact; hence, it is probable that the disease, once begun, is modified by secondary infections of one kind or another. Secondary pus-infection is frequently recognized, and the manner in which some forms of eczema respond to antiparasitic treatment leads to the inference that some of the many micro-organisms found in the lesions are active in the prolongation, if not in the production, of the disease. Numerous parasites, including the morococcus of Unna, have been cultivated and described as the cause of eczema, but their etiological relations to the disease have not been demonstrated.¹

The probability that some forms of eczema are due to toxins of different micro-organisms is established by the experiments of Bender, Bockhart and Gerlach.² These observers in a long series of controlled experiments found that inoculation of the normal skin with cultures of staphylococci produced an impetigo or a simple pyoderma but when filtered bouillon cultures of the same organisms, which contained no cocci but only their toxins, were employed, the result was always a papulo-vesicular eczema of ordinary type. The primary vesicles so produced were sterile, but later contained staphylococci.

Bockhart³ believes that in individuals predisposed to eczema staphylococci may remain inert in the mouths of the follicles until some cause from without or within arouses them into activity. They then produce toxins which are diffused through the epidermis and produce eczema. The lesions so produced are invaded subsequently by cocci and other organisms, so that the later changes in eczema are due largely to other agencies.

¹ For a full discussion of the parasitic and other causes of eczema consult the Transactions of the Fourth International Congress of Dermatology, Paris, 1900 (Compt. rendu, XIII. Congr. Internat. de méd., pp. 9-94) (abstr. in B. J. D., 1900, xii., p. 326); also papers by Morris, B. J. D., 1898, x., p. 359; Roberts, Ibid., 1899, xi., pp. 7 and 66; Török, Annales, 1898, s. iii., ix., p. 1073; and 1899, s. iii., x., p. 37; Sabouraud, Ibid., 1899, s. 3, x., p. 305; Leredde, Ibid., 1899, s. iii., x., pp. 30 and 438; Unna, Monatsh., 1899, xxix., p. 106; Galloway and Eyre, B. J. D., 1900, xii., p. 307 (bibliography); Kromayer, Archiv, 1900, liii., p. 85; Scholtz et Raab, Annales, 1900, s. 4, i., p. 409; Whitfield, B. J. D., 1900, xii., p. 406; Schwenter-Trachsler, Monatsh., 1903, xxxvii., p. 233; Engmann, American Medicine, 1902, iv., p. 769; see also chapters by Besnier, La Pratique Dermatologique, and Unna, Mraček's Handbuch. A brief summary is to be found in MacLeod's Pathology, p. 341.

² Monatsh., 1901, xxxiii., p. 149.

³ Ibid., p. 421.

Pathology.—The pathological changes in eczema are those of inflammation of the skin, varying somewhat with the acuteness or chronicity of the process, and with the character and career of the exudate furnished in each expression of the disease. In most cases there is, first, a circumscribed or diffused hyperæmia of the affected part followed by dilatation and congestion of the blood-vessels of the corium, exudation of serum, diapedesis of white blood-corpuscles, and œdema.

The process probably begins in the papillary layer, from which it extends to the epidermis, to the deeper parts of the corium, and in exceptional cases inward even to the subcutaneous tissue. The œdematous infiltration may be quite extensive, producing marked swelling over considerable areas, or it may be slight and circumscribed. At times it appears only about the hair-follicles, producing perifollicular papules. The cell-infiltration about the vessels of the corium is formed in part of leukocytes, some of which wander outward into the rete, but is probably composed largely of young connective-tissue cells.

The epithelial changes in eczema vary greatly with the stage, intensity, and type of the disease. It is not determined definitely if these changes are always dependent upon and follow the conditions described above in the corium, or if they are usually, or even rarely, primary in origin. It is probable that they are secondary to the vascular changes in the corium, though some observers, including Unna and Leloir, believe that in most cases the epithelium is first affected. In practically all forms of eczema there is a parenchymatous œdema of the epithelial cells, especially of the transitional layers, as a result of which there is imperfect keratinization (parakeratosis) of the horny layers, the cells of which contain some moisture, retain imperfect nuclei, and are exfoliated in scales. In acute erythematous eczema running a brief course the epithelial changes may be limited to this parakeratosis, but in most cases they are followed by vesicle-formation in the upper part of the rete. The manner in which vesicles are formed is a matter of dispute. Some observers report that the first vesicles of acute eczema apparently are due to the formation in a number of contiguous cells of a clear space between the nucleus and the protoplasm, which enlarges until there is left merely a meshwork filled with serum. Other writers¹ state that the prickle-cells are forced apart mechanically by the intercellular œdema forming small spaces. The vesicles so produced may be unilocular, but often are subdivided by remnants of prickle-cells into several chambers. The œdema may cause a separation of practically all the cells, producing Unna's "spongy metamorphosis" of the epidermis. The intracellular œdema described above follows. As a result of compression the prickle-cells about the vesicle may assume a spindle-shape. The vesicles, though usually superficially situated, may be found in any part of the rete. MacLeod states that they form

¹ Cf. MacLeod, Pathology, p. 101.

in the region of least resistance, which in eczema is commonly the superficial portion of the prickle-cell layer, but when the œdema appears with unusual rapidity the greatest strain is put on the cells nearest the basal layer, where the vesicles then are formed. Again, the œdema may diminish somewhat, permitting the cells beneath the vesicles to become cornified, thus locating the vesicle entirely within the stratum corneum. The vesicles contain first serum with fibrin; later, leukocytes in varying numbers, more or less degenerated epithelial cells, and nuclei. As a result of more active degeneration of cells, or of secondary infection, the vesicles become pustules, the contents of which dry on the surface, forming thick crusts. In very acute cases, with an abundant exudate, the horny layer may be raised from the rete to form vesicles or bullæ. According to Unna, vesicles in the later stages of eczema are due solely to an intercellular œdema.

In eczema rubrum the horny layer is raised from the rete and destroyed without true vesicle-formation. The rete is thus exposed directly to the air, or is partly covered by an amorphous coating of dried serum and degenerated cells.

In the later stages of eczema there is more or less hypertrophy of the rete (Unna's acanthosis), with corresponding enlargement of the papillæ, forming papules and elevated, thickened areas. In chronic cases the cell-infiltration and proliferation in the corium become very conspicuous, producing the thickening of the skin so characteristic of patches of chronic eczema. In these cases the papillæ are larger than normal, and the vessels of the corium are dilated and surrounded by connective-tissue cells. The process may extend to the subcutaneous fatty layer, which then loses much of its fat, and becomes dense and attached to the skin. Hypertrophy of connective tissue and lymphatic obstruction with elephantiasic changes may follow. In these cases the sebaceous and coil-glands and the hair-follicles may be partially or entirely destroyed by undergoing degeneration and atrophy.

According to Ehrmann and Fick¹ three conditions, viz., acanthosis, spongiosis, and parakeratosis are always to be found in eczema the degree of development of each varying with the type of the disease.

The fluid exuded in eczema, in vesiculation, or in a free discharge from the surface, is always characteristic. Though in the earliest vesicles it is a simple blood-serum, it soon becomes a yellowish-white, sticky, and syrupy liquid, feebly alkaline in reaction and depositing albumin in abundance when treated with heat and nitric acid. Exposed to the air, it desiccates in light-yellowish to brownish friable crusts resembling honey or gum.

Increase in the pigment-particles distributed to the epithelia of the rete is characteristic of the chronic forms of eczema, and more especially of those in which the circulation is somewhat impeded by the influence of gravity, as, for example, in the lower extremities. This increased pigmentation is true, however, of all diseases accom-

¹ *Kompendium der Speziellen Histopathologie der Haut*, Wien, 1906,

panied by an augmented afflux of blood to any part of the body, as, for example, over the surfaces of joints to which for many years stimulating embrocations have been applied.

Diagnosis.—Though of a dozen consecutive cases of eczema no two may look alike, yet they all have some characteristics in common and the diagnosis is usually attended with little difficulty. Eczema in its manifestations is such a protean disease and is, moreover, of such frequent occurrence, that it is necessary to establish a differential diagnosis between it and a large number of other cutaneous disorders. The more important of these are named below in alphabetical order for convenience of reference, the distinctive peculiarities of each being briefly appended. In making a diagnosis it must be remembered that eczema may coexist with any other disease of the skin, and that it very frequently thus complicates such cutaneous disorders as seborrhœa, psoriasis, and scabies.

Acne.—Acne occurs chiefly on the face, the neck, and the back of the trunk, and its pustular forms may be mistaken for eczema of the same localities; but pustular acne is usually accompanied by a deeper-seated infiltration than the similar lesions of eczema, and this infiltration is also generally limited to the sebaceous glands or the periglandular tissue. In eczema the itching is often severe, while in acne the subjective sensations are those of heat or burning. Comedones intermingled with the pustules of acne will aid in distinguishing the two.

Erythematous eczema of the face is to be distinguished from *Acne Rosacea* by the more generalized infiltration of the former, its production of itching, and its greater diffusion over the face; while acne rosacea is limited more often to the cheeks, nose, and brow, and to the region adjacent to these parts. The patch of erythematous eczema is "hot," that of acne rosacea is cold, to the touch. The former is seen in infancy, the latter is rare in that period of life. Acne rosacea in many cases is distinguished readily by the development of visible blood-vessels in the skin of the cheeks or the nasal region. Lastly, in erythematous eczema the eyelids may suffer, while in acne rosacea this is the exception. In severe forms of acne the subepidermic pus-formation and the resulting scar will prove significant.

Dermatitis.—Dermatitis of artificial origin is to be distinguished from idiopathic eczema rather by its history than by special differences in the appearance or evolution of the lesions. In many cases the two affections are indistinguishable. A history of traumatism or of the external application of irritant or of toxic articles will often serve to distinguish the two. When the dermatitis has been produced by an externally applied irritant the resulting inflammation of the skin will often exactly outline the area of contact. Dermatitis of artificial production is usually sudden in its onset, the date of which will nearly correspond with the time of operation of an exciting cause. The subsidence of the symptoms after the withdrawal of the

cause will also point to the nature of the affection. Eczema is also much more capricious in its distribution and career than dermatitis.

Erysipelas.—Erysipelas is generally accompanied by febrile symptoms; in some cases bullæ appear. The affected surface is reddened, much more swollen than in eczema, owing to the involvement of deeper tissues, and it exhibits besides a characteristic shining appearance, which is always absent in erythematous eczema. The line of demarcation between the affected and unaffected portions of the skin is usually distinctly defined in erysipelas, ill defined in eczema, and in the former disease is markedly tender. Erysipelas is an exceedingly acute affection and spreads from one point to another with a rapidity that is never noticed in eczema; the latter disease, moreover, usually exhibits under a lens its minute papules or vesicles. In eczema also, when occurring upon the face in the erythematous form, the scalp is usually spared, while erysipelas tends to invade the scalp and the regions covered by the beard.

Erythema.—Eczema is to be distinguished from the forms of erythema which are due to hyperæmia only by the presence of an inflammatory process. The erythema simplex which advances to exudation at once transgresses the artificial line of distinction between the purely congestive and the purely exudative disorders. It must therefore be remembered that many eczemas begin as erythemata, and that clinically the latter may represent but a stage in the morbid process. The discharge in erythema intertrigo results from imprisoned or from chemically altered sweat, and will not stiffen linen as does the serous exudation of vesicular eczema for example. Erythema multiforme, an affection really on the border-line between the two pathological classes here sought to be distinguished, will be recognized by the absence of severe itching and the recurrence of the disorder at certain special seasons of the year; while Erythema papulosum, E. tuberosum, and E. nodosum display solid elevations of the skin-surface much exceeding in size the minute lesions of papular eczema.

Herpes.—Eczema is so associated with the occurrence of a vesicle in the minds of many that other vesicular disorders are likely to be confounded with it. But in herpes febrilis the vesicles usually are grouped about the mucous outlets of the body, and when actually under observation they exceed in size the minute and transitory lesions of vesicular eczema. In herpes zoster, with the limitation of the eruption in the course of a nerve to one side of the body and the production of grouped vesicles of a larger size and more persistent type, there is commonly a history of precedent or coincident neuralgic pain. The subjective sensation in the skin is a decided burning rather than itching, and there is a possibility of the subsequent production of scars.

Impetigo.—In these forms of disease the pustular lesions are usually isolated, do not spring from an infiltrated surface on which other lesions may be visible, and are unaccompanied by the intense pruritus

which is characteristic of eczema. The pustules, moreover, are larger and the resulting crusts as a rule, are bulkier and darker colored than those in eczema. Again, in pustular eczema the cutaneous affection usually occurs in one or more patches, while in impetigo a dozen or more isolated pustules may be irregularly scattered over the entire surface of the body. In impetigo there may be a history of extension of the disease from one member of a family to another.

Lichen Planus.—Papular eczema may be confounded with lichen planus, but in the latter disease the typical papule has an irregular or polygonal base; a flat or umbilicated apex, which is covered with a thin, closely adherent, varnished-looking scale; and a violaceous or dull-crimson hue. The papules of eczema have round or oval bases, acuminate or rounded summits, and are brighter red in color. They also form more rapidly and undergo change of type more frequently than the more persistent papules of lichen planus. The patches of lichen planus are more sharply defined than those of eczema and are usually angular or linear in outline. The lesions of lichen planus on disappearing leave a characteristic brown or sepia-tinted pigmentation.

Lupus Erythematosus.—Lupus erythematosus greatly resembles certain forms of squamous eczema. The great chronicity of lupus; the firm attachment of the scales; the symmetrical distribution of many patches upon the face; the association of some forms of the disease with the sebaceous glands; the definite border of each involved area; and, above all, the discovery of a cicatrix left by the morbid processes will sufficiently distinguish the disorder. In eczema there are usually itching, often vesiculation, more rapid extension of the borders of a single patch, and scales much more loosely attached than in erythematosus lupus. The scales of eczema are never provided, as in lupus erythematosus, with stalactitiform plugs on the inferior surface.

Lupus Vulgaris.—Lupus vulgaris is readily distinguished from eczema by its more chronic career, by its larger papules and tubercles of dark reddish-brown hue, and by every one of its destructive processes, none of which is ever recognized in eczema.

Mycosis Fungoides.—Mycosis fungoides, in its earliest stages, may be indistinguishable clinically from some forms of localized or even generalized eczema. As a rule, however, the early erythematous and eczematoid lesions of mycosis fungoides can be recognized by their characteristic gyrate outlines, assuming, as they do, the shape of a kidney, horseshoe, half-moon, and other fantastic, more or less circinate forms. These figures may change frequently in form and location, or may disappear spontaneously, to return in the same or in new sites. They differ further from eczema in being located on any or every part of the body, independently of external influences, and in failing to respond to treatment during months or years. After the formation of characteristic thickened and elevated plaques the diagnosis is not difficult.

Pediculosis.—As eczema is often induced by lice upon the head,

the pubes, or the clothing, it is always necessary to exclude the operation of such causes for both diagnostic and therapeutic purposes. Eczema limited to the pubic region or to the pubic and axillary regions should suggest careful examination of the skin and the hairs for the discovery of the crab-louse. As for the *pediculus corporis*, it should be the rule of the physician (whatever the social position or refinement of his patient), to search in a suspected case for evidence of the parasite upon the under surface of the clothing worn next the skin, at the instant of its removal and while the patient supposes him to be busied with the inspection of the cutaneous lesions. The excoriations produced by scratching wounds inflicted by body-lice are usually out of all proportion to the amount of skin-disease present; and this excoriation is the most significant of all symptoms next to the discovery of the *corpus delicti*. Head-lice may precede or may follow eczema of the scalp, but either they or their ova (nits), clinging in numbers to the hairs, will be visible to him who looks carefully for them.

Pemphigus and Pityriasis Rubra.—The large isolated bullæ of pemphigus vulgaris are never seen in eczema. In pemphigus foliaceus the lesions are succeeded by the formation of pastry-like crusts, serous exudation, considerable soreness, and the eventual production of an extensive and often fatal exfoliative dermatitis. Marasmus gradually or in some cases rapidly ensues, while, as a rule, itching and infiltration are not present. The disease known as pityriasis rubra is equally rare and fatal, and, though unattended with the production of bullæ, is characterized by an abundant epidermic exfoliation; itching and infiltration being either entirely wanting or insignificant in comparison with the other symptoms present. The scales, too, are papery, large, and thin; there is no vesiculation and moisture, and little, if any, infiltration of the skin. The integument is, moreover, of a uniformly reddish hue. Both pemphigus foliaceus and pityriasis rubra are particularly liable to be complicated with chills or with uncontrollable diarrhœa. Without question, many of the reported cases of so-called "pityriasis rubra" are instances of squamous eczema or of simple exfoliative dermatitis. Here the limitation of the disease to one or more patches upon the body, the severe itching, and the distinct infiltration of the patch point to the eczematous character of the disease. Observation of such patients will finally convince the physician, in many cases, that there is occasional weeping from the surface.

Pityriasis Rubra Pilaris often resembles in a high degree, and it may indeed be confused with, the squamous forms of eczema. In general there are not found in eczema characteristic lichenoid papules formed about the hair-follicles, with their hyperkeratinized cap sheathing the follicular orifice. Nor is the selection of the extremities, and especially the dorsal aspect of the fingers, characteristic of eczema. In eczema there are usually distinct marks of scratching that may wholly be wanting in pityriasis rubra pilaris; and the latter has in most cases a more chronic course.

Prurigo.—In the prurigo of Hebra, a disease exceedingly rare in America, there are infiltration, intense itching, and numerous minute and larger papules. But this disease usually occurs within a year or two after birth and lasts for a lifetime, extending generally over the greater part of the body, sparing only the palms and soles (which eczema does not), and is accompanied by inguinal adenopathy.

Pruritus.—In pruritus, often confounded with prurigo, there is itching without lesion of the skin save that induced by scratching to relieve the sensation. Hence, pruritus without scratching will not reveal a cutaneous disease, while pruritus with scratching will exhibit either excoriations or a dermatitis induced by the attacks made upon the skin. The former condition, however, is rarely noted. The distinction will be clear when it is remembered, first, that pruritus is usually of a paroxysmal character, being worse regularly at certain hours or seasons; second, that pruritus not originating in a cutaneous lesion, but indirectly producing the latter by the medium of the finger-nails, never exhibits as much cutaneous excoriation as the skin bitten by lice or attacked with eczema. The impressive features here are always the disproportion between the complaint of the patient and the visible symptoms, and the vast preponderance of all lesions in those regions of the body most accessible to the hands, such as the anterior faces of the limbs, the genital region, the lower belly, etc.

Psoriasis.—Psoriasis and eczema in typical forms are distinct. Variations in type from one to the other furnish many obscure cases. The following are the chief diagnostic points in psoriasis: sharp definition of contour of patch; abundance and lustrous hue of the scales; absence of moisture; vascularity of tissue beneath the scales; sites of election on posterior aspect of the trunk and extensor surfaces of limbs; chronicity in course; uniformity of lesions; and usually absence of itching. In eczema there are an ill-defined contour; usually scanty scales not having a nacreous hue; a preference for the flexor surfaces of the extremities, though the disease may occur in any portion of the body; generally, at some period in its course, a history of moisture; polymorphism, as regards lesions; and a marked intensity of subjective sensations. Upon the scalp psoriasis is prone to extend beyond the hairy border in a fillet stretching across the upper portion of the forehead, thence irregularly down in front of the ears; while eczema of the face, when the scalp is also invaded, departs boldly from the hairy parts to the lower forehead, the lips, nose, cheeks, or chin, regions which are relatively spared by psoriasis. Finally, the two diseases, in doubtful cases, will generally be distinguished by carefully searching the entire surface of the body, upon some part of which in psoriasis there will usually be discovered a tell-tale patch of typical appearance.

Scabies.—Scabies is really an artificial dermatitis induced by the incursions of the *acarus scabiei*, and its lesions are thus very similar to those of eczema. In scabies, however, the pruritus is

intense and the recently formed papules, vesicles, and pustules are more distinct and isolated than in eczema. The discovery of the parasite, especially if there be a history of contagion, and the localization of the disease in its sites of preference, will at once determine the diagnosis. Scabies never attacks the scalp. Its sites of preference are in both sexes the fingers, hands, wrists, and axillæ; in women the breast and the nipple; in men the penis; and in children the buttocks. The presence of the acarian furrow, if the disease has existed for some time, and the appearance of minute blackish dots or points upon or about the lesions, usually suffice to establish the nature of the disease.

Seborrhœa.—Seborrhœa and eczema may coexist, either disease preceding the other. Typical forms of each are readily distinguished. In eczema there are infiltration and much consequent itching; in seborrhœa there is neither. The scales of seborrhœa are more voluminous and greasy than those of eczema, are freely shed from the surface, and are seated usually upon an integument of scarcely altered hue; in eczema the scales are dry, scanty, and more firmly attached to an hyperæmic base. Seborrhœa of the hairy parts is generally symmetrically diffused; eczema, though occurring with ill-defined contour, is rarely as symmetrical, usually more acute, and is seldom followed by alopecia. Upon non-hairy portions of the body the same distinctions to a great extent can be observed. The crusts of eczema removed from the face generally disclose beneath them an oozing surface, while the under surface of these crusts never exhibits the stalactite-like prolongations which pass from the under surface of seborrhœic crusts into the patulous orifices of the excretory ducts of the sebaceous glands. In dermatitis seborrhœica the features of both diseases are almost completely fused.

Sycosis.—Both the hyphogenous and the coccogenous forms of sycosis are limited to the region of the beard, while eczema of the hairy portions of the face will usually be found to affect other parts. In eczema the itching is severe, the exudation spreads beyond the limits of the beard, and the discharge is characteristic; while in both forms of sycosis there is less oozing and the subjective symptoms are trivial. The discovery of the parasite in the root or the shaft of the hair will at once distinguish the hyphogenous forms of the disease. In coccogenous sycosis each pustule is perforated by a hair. Eczema limited to the region of the beard is even rarer than the two varieties of sycosis. The circumscribed indurations and tuberculations of the affection produced by the trichophytons, as well as the loosening of the hairs in their follicles, constitute further distinctive differences.

Syphilis.—Several syphilitic eruptions resemble certain forms of eczema. In the eruptions due to syphilis, however, there is usually a history of infection; of involvement of the glands and mucous surfaces; of ulceration and cicatrices in advanced periods, and, especially in the case of infants with an eczema-like eruption, a his-

tory of snuffles. The intense itching of eczema is characteristic of no one of the syphilides, and the latter are remarkable for their tendency to occur with a circular or partially circular outline, and to be covered with bulky malodorous crusts. A point worthy of note is that compared with chronic eczematous affections a syphilitic eruption limited for an equal period of time to one locality will often ulcerate or exhibit evidences of repair by scar-tissue, no such results occurring in eczema.

Syphilis of the palms and soles exhibits very distinct outlines in the usually circular, circumscribed, and deeply infiltrated patches present, which are often symmetrical in development, or are at least situated on both sides of the body even if more fully developed upon one limb. Syphilitic pustules upon the scalp usually rise above superficial but well-defined ulcers. Syphilitic eruptions encircling the mouth in children are less angry-looking and formidable than those of severe eczema of the same region, being often made up of flattened papules, moist or scaling, grouped in circles about the lips, with mucous patches at the angles.

Tinea Circinata.—In ringworm there should be a history of contagion, microscopical discovery of the vegetable parasite, distinct contour of all separate patches, and absence of marked subjective sensations and of discharge. These symptoms are not those of eczema. In ringworm of the scalp the hairs loosened in their follicles are usually either brittle or are actually broken at a short distance from the scalp; the scales are fine, dirty white, and not torn from the surface by the finger-nails. In eczema the hairs are unaffected, and their extraction is productive of pain. In ringworm of the body the patches are distinctly circular, are more scaly or papular at periphery than centre, and, moreover, yield with promptness to the action of a parasiticide. Occurring about the thighs and ano-genital region, the disease may be complicated by eczema, but the characteristic “festooning” of the advancing border of the patch downward along the thigh, or upward over the pubes, will suggest a microscopical examination of the scales scraped from the surface.

Tinea Favosa.—The large, friable, dirty crusts of an old and neglected favus of the scalp might be mistaken for the crusts of eczema of the same part; but here the exudation is slight, and there is little scratching, as in eczema, hence no history of discharge. The odor, moreover, is peculiar. In case of uncertainty a careful search would reveal a few characteristic cup-shaped and yellow crusts or the microscope would demonstrate the parasitic nature of the disorder.

Tinea Versicolor.—In this disease, also, the microscope will reveal, beneath the epidermal plates, the spores and filaments of the fungus which produces the ailment. From eczema the disease is easily distinguished by the absence of infiltration and of any history of inflammation; by the very slight subjective sensation it produces; by its peculiar fawn- to chocolate-colored, slightly yellowish patches, which are covered with superficial furfuraceous scales, are limited

to the covered parts of the body and often to the anterior surface of the trunk, and are readily removed by the action of a parasiticide.

Urticaria.—In papular forms of the disease there may be a resemblance to eczema. This resemblance is more marked in children, as here the two diseases may be intermingled. Characteristic wheals often occur by the side of eczematous patches, but, as a rule, urticarial lesions are less grouped, more generally disseminated, more evanescent and much less scratched.

Treatment.—The treatment of eczema usually presents a complicated problem. The causes of the disease are numerous, frequently obscure, and when discovered are often difficult to remove. Eczema shows little tendency to spontaneous recovery, but tends rather to persist, to spread to contiguous or distant parts of the body, and to recur. Although many cases of the disease respond well to local treatment alone if the affected surface can be given absolute rest and kept constantly covered with the desired dressing, such ideal treatment can rarely be carried out except in hospital-patients. Moreover, in many cases of eczema the general health of the patient must be improved before local treatment can be effective. The nutrition and functional activity of the skin depend largely upon the condition of the general system, for the skin is but one of many organs in a complex organism. It follows also that every serious disease of the skin must interfere more or less with the general health. The fear that too rapid a cure of eczema may result in disease of deeper-seated organs is baseless. The sudden improvement or disappearance of an acute eczema coincidently with the development of a pneumonia or other grave disorder may be explained by the rapid withdrawal of a large amount of blood from the skin-surface to the newly congested organ. The improvement in the eczema is thus a result and not a cause of the deeper-seated disease.

The treatment of eczema requires both local and constitutional management.

Constitutional Treatment.—In many cases internal treatment may be wholly ignored, and eczema be successfully controlled by local measures alone, even though there be coincident systemic disease. Often, however, the eczema is an external expression or result of other pathological conditions which must be removed before the eczema can be permanently cured. These systemic disorders vary widely, ranging through the whole field of internal medicine and hygiene. In these pages a few suggestions only can be given regarding the internal treatment of eczema, much being left to the practitioner's knowledge of general medicine. It is often necessary not only to relieve disease of other organs, but also to study the patient's temperament, habits of eating, drinking, bathing, sleeping, etc., before an obscure cause of stubborn eczema can be found and removed.

DIET.—No absolute rule can be laid down regarding the diet in

eczema. Each individual should be given the quantity and quality of food that will best nourish his body without interfering with digestion and elimination. The anæmic, strumous, and poorly nourished subject should be given sufficient fresh beef, mutton, eggs, milk, cream, vegetables, and other nourishing foods. Cod-liver oil, butter, and other fats, when easily digested, are of special value, as also are the various malt-preparations, particularly when digestion of the carbohydrates is at fault. In the plethoric, the overfed, the gouty, and in those suffering from faulty digestion and elimination, a diet restricted to the lowest point consistent with the health of the individual is often of the greatest importance. In these cases excellent results are obtained by limiting the patient to a diet of bread and milk, or of milk alone, or of milk and seltzer-water, for several weeks. In general, the diet allowed the eczematous patient should be limited to the most digestible articles of food and should exclude those (a list of which is given in the chapter on Urticaria) capable of exciting cutaneous irritation. Cooked vegetables, fruit, and a small quantity of fresh meat may be permitted; but starchy articles in excess, hot breads and cakes, pastry, confectionery, cheese, pickles and pickled meats, the heavier vegetables, shell-fish, salted fish and meats, pork, and veal should be avoided. Coffee, tea, and cocoa are in the doubtful list, as they are positively injurious to some patients and apparently without effect in others. Water, as free from mineral constituents as procurable, may be taken freely between meals. Tobacco should always be forbidden to male patients suffering from a serious eczematous attack. Alcohol in every form is contraindicated save in conditions of debility, or in case of its previous habitual use in moderation by persons of advanced years. In gouty patients the dietary should be of the strictest appropriate to that condition, and in diabetic eczema the regimen proper in glycosuria is observed with great benefit in most cases.

INTERNAL MEDICATION.—There are no specifics for eczema. Such remedies only should be given as are indicated by the general condition of the individual. Over-medication and uncalled-for dosing with "blood" medicines is a common error in the management of this disease. The number of patients presenting themselves for treatment of eczema, both in dispensaries and hospitals and in private practice, who have aggravated their condition by medicaments they have swallowed is incredibly large. Striking results are often obtained by merely setting aside the operation of these mischievous medicinal agents. The chief object of the constitutional, and also of the local, treatment of eczema is to remove all sources of irritation of the inflamed skin.

An attempt to relieve pruritus by the use of anodynes internally is rarely necessary, and usually aggravates the disorder. Opium and its preparations increase the pruritus, though in full doses they relieve temporarily. With some patients and especially children, full doses of quinine may relieve itching. Aspirin is of value as an

anti-pruritic. Less frequently full doses of calcium chloride, largely diluted with water, may serve the same purpose. In an emergency, chloral, phenacetin, sulphonal, or even the bromides, may be given, but like opium, they all are liable to aggravate the pruritus after a first anodyne effect has passed.

In the management of acute eczema cooling draughts are useful; and in all cases occurring in patients who are plethoric, or constipated, or who suffer from other symptoms of imperfect excretion, aperients and cathartics are needed. Often a brisk mercurial purgative in the form of blue mass or the compound cathartic pill may be ordered at the outset. Five grains (0.33) of blue mass or one to three grains (0.06–0.2) of calomel may be given each night, followed by a saline laxative in the morning, for several successive days, or once every third or fourth day. A tenth of a grain (0.006) of calomel combined with sodium bicarbonate may be given every hour for a day or two, and then three or four times daily for two weeks or longer, if at the same time salines are used to keep the bowels freely open. The rhubarb-and-soda mixture answers well in some cases. Podophyllin, or the familiar combination, nux vomica and aloes, may be substituted for these articles. The saline cathartics, whether employed in medicinal formulæ or in natural mineral waters, such as the Hathorn, Carlsbad, Hunyadi János, or Friedrichshall, are exceedingly useful in the management of most cases. The following is a valuable combination often advised for cases in which both iron and magnesium sulphate are indicated:

℞ Magnes. sulphat.,	ʒij;	60	66
Acid. sulphur. dil.,	fʒij;	8	
Ferri sulph.,	ʒss;		
Sodii chlorid.,	ʒj;	4	
Cardamom. tinct. comp.,	fʒiv;	15	
Aq. dest.,	ad ʒss;	240	M.

Filtra. Sig.—A tablespoonful before breakfast in a tumblerful of cool or of hot water.

An excellent remedy for some cases is from 15 to 20 drops of a fluid containing 2 parts of the fluid extract of cascara sagrada to 1 part each of glycerin and tincture of aloes, the dose to be taken at bedtime or before breakfast in a small glassful of water. A full dose of castor-oil on retiring is an excellent remedy in many neurotic cases, and may be continued for weeks if needed.

In some cases of renal derangement the alkaline diuretics are indicated, such as potassium acetate, carbonate, or citrate, administered with nitre, squills, caffeine, or lithium benzoate in from 3 to 5 grain (0.20–0.33) doses before meals, and in gouty cases colchicum, Vichy water, etc. Distilled or other pure water, or in suitable cases the alkaline spring-waters, taken in large quantities before meals and between meals, are very valuable as diuretics and as a means of encouraging elimination. In patients suffering from acid dyspepsia liquor potassæ, sodium bicarbonate, ammonium carbonate, or milk of magnesia may be required. Salol and other intestinal antiseptics are often of value.

Aloes and iron, or aloes and ergot, are indicated in special cases. Where diuretics and alkalies are both indicated the following formula is often of service:

R	Magnes. sulphat.,	ʒss;	15	
	Magnes. carbonat.,	ʒj;	4	
	Colehici tinct.,	fʒss;	2	
	Menth. pip. ol.,	℥iij;		2
	Aq. des.,	fʒvj;	180	M.

Sig.—Two tablespoonfuls in a wineglassful of water every three or four hours.

Cod-liver oil is indicated in all cases of struma and tuberculosis; calcium phosphate in bronchitis; iron in anæmia and chlorosis; strychnine, hypophosphites, and other nerve-tonics in neurotic cases. Antimony in small doses as an alterative and nerve-tonic or in large doses to reduce vascular pressure is often of value.

In fleshy children affected with eczema calomel internally is a valuable remedy; from $\frac{1}{2}$ grain to 2 grains (0.03–0.133), with 2 to 3 (0.13–0.20) of rhubarb, rubbed up with 5 grains (0.33), of calcined magnesia, may be given once in a day to an infant; or $\frac{1}{20}$ of a grain (0.003) of calomel, rubbed up with sugar of milk, may be given, three times daily, for ten or twelve days. Small doses of the unsipped syrup of rhubarb, with or without magnesia, may be required for the constipation of infants, or from 1 to 3 drachms (4.–12.) each of powdered rhubarb and sodium bicarbonate in 4 ounces (120.) of peppermint-water, of which a teaspoonful may be administered two or three times or oftener daily. Quinine, strychnine, syrup of ferrous iodide, and wine of iron may also be used with advantage when indicated in these little patients.

Beside those enumerated above may be named the following articles, which, after internal administration, have been reported as efficient in the hands of various authorities: calx sulphurata, viola tricolor, sodium hyposulphite, ichthyol, chrysarobin, tar, carbolic acid, sulphur, pilocarpine, and turpentine. Arsenic, which has been so largely employed by the general practitioner in eczema and in other disorders of the skin, is an uncertain remedy in all cutaneous diseases; it is equally uncertain in eczema, and has unquestionably aggravated as many cases as it has relieved. Its value in some chronic papular and squamous forms of the disease is undoubted, and in small doses as a nerve-tonic it is often of value, but it should never be given in acute cases or where there is any digestive disturbance.

Sunlight, fresh air, suitable clothing, and due *régime* as to pleasure and business, must be, for many patients, controlled by the physician. These agencies do not cure eczema; but they do much to aid in its management; they may do more, if neglected, to permit its aggravation. Crocker advocates counter-irritation over the spine—over the nape of the neck for eczemas of the upper segment of the body; over the dorso-lumbar vertebræ for the lower parts. Jackson has used the ice-bag with advantage in the same way. Coun-

ter-irritation of the corresponding part of the lateral half of the body for the relief of an eczematous patch of long standing limited strictly to the other side may also be employed in rare cases.

Local Treatment.—Local treatment is of value in all cases of eczema, is usually imperative, and often is the only treatment necessary. The remedies recommended for external application in the various forms and phases of eczema are so numerous and varied that barely to mention all would require many pages; and not even the expert can be sufficiently familiar with them all to use each intelligently. A comparatively small number of remedies skilfully handled will suffice in all but rare cases. It often happens that in a given type of the disease a treatment which one physician uses with brilliant success fails utterly to serve a fellow-practitioner who is equally skilful, but who is less familiar with this particular method. One of the most common errors in the local treatment of eczema lies in the frequency with which, in a difficult case, a succession of new medicaments is tried instead of studying more carefully the details of application of familiar remedies. It must not be forgotten that each individual skin, like its possessor, has its idiosyncrasies. A remedy that in a given type of the disease will commonly give prompt relief, may in others prove of no benefit and even aggravate the condition. An idiosyncrasy may exist forbidding the use of particular drugs, such as carbolic acid, glycerin, resorcin, etc., or it may prevent the employment of certain classes of applications, as, for example, ointments, powders, lotions, etc. The choice of remedies must further be influenced in each case by a consideration of the type or phase, severity, and duration of the disease, of the region and extent of surface involved, and of the age, occupation, and climatic and other surroundings of the patient.

The general objects and principles of treatment in eczema may conveniently be grouped under the following heads: (1) exclusion of all sources of irritation to the skin; (2) relief from pruritus, burning, and other morbid sensations; (3) antiseptic dressing; (4) reduction of local congestion in acute, and stimulation of circulation in chronic, cases; (5) repair of the horny layer in acute, and destruction of the thickened and abnormally keratinized horny layer in chronic, forms of the disease.

1. **EXCLUSION OF ALL SOURCES OF IRRITATION.**—This is one of the most important, the most varied, and often the most difficult and complex problems. Frequently a simple protective dressing is all that is required; more commonly the object is not so readily attained. Irritation of the skin due to its malnutrition or to conditions of ill health must be relieved in accordance with the principles of internal medicine, as has been indicated in discussing the internal treatment of eczema.

The exclusion of all sources of irritation necessitates, secondly the avoidance of all injurious external contacts. Only gross ignorance or carelessness will overlook the fact that the inflamed skin,

like the inflamed bone or the inflamed bladder, calls imperatively for rest. The prevalent idea, however, is that the patient with an inflamed joint retires to his couch or bed, while the patient with an eczema, if his disease be not so formidable as to necessitate temporary withdrawal from the pursuits of business or of pleasure, belongs always to the peripatetic class. He consults a physician, swallows some medicine, anoints his eczematous skin with a salve, and returns from necessity or from choice to the vocation in which his complaint was begotten. Such an one should distinctly understand that his recovery will be much slower and more uncertain than it would be with the rest and protection that every inflamed organ demands.

Next is involved the exclusion of all topical irritants (in the hands of either physician or patient) designed to relieve the disorder, but having a precisely opposite effect. The number and variety of these medicaments are far from being commonly appreciated; some are useful in advanced stages of the disorder, and harmful in its earlier periods. These articles, which are generally ordered by persons with a limited experience in diseases of the skin, represent a long list of stimulating and astringent ointments. Some are employed in sheer ignorance of their effects, as, for example, crude petroleum, strong acids and alkalies, silver nitrate, turpentine, and concentrated solutions of corrosive sublimate, intended to "burn out" the disease.

Lastly, the exclusion of all sources of irritation necessitates protecting the involved surface from the excoriations and other traumatism produced by scratching, rubbing, and excessive washing of the eczematous skin, and from exposure of the inflamed surface to the air. The various applications and protective dressings here serve their purpose, but in the case of adults some restraint to prevent rubbing and scratching is also necessary; in the case of infants this restraint may need to be enforced. Fixed dressings are often of great value in immobilizing a part, or in preventing friction, bruising, or other injury to the inflamed surface. A light elbow-splint to prevent flexion of the joint often is of service in keeping the fingers from the face. Most patients have to be repeatedly and forcibly impressed with the fact that a few minutes of scratching or rubbing, or one untimely washing of the inflamed surface, or its unnecessary exposure to the air may undo all that has been gained in several days of patient and successful treatment.

The great importance of rest and freedom from irritation of all sorts in eczema is well illustrated by the newborn infant, whose sensitive skin early responds by an explosion of eczema to its first harsh acquaintance with the outer world. It is a fact of importance that no child is born into the world eczematous. While nutritive and other constitutional changes, consequent upon the assumption of extra-uterine life, undoubtedly have their influence, the difference between the child unborn and the child born is, as regards eczema, a difference chiefly of skin-protection and skin-exposure. The former

enjoys what White has aptly termed a "prolonged, placid, subaqueous life." Anointed with unguent and immersed in its water-bath of grateful temperature, its skin cannot be fretted to produce an eczema. The child, abruptly and often rudely brought into contact with the outer world, may speedily exhibit the most formidable symptoms of the disease. This point is worthy of especial emphasis because of the wide diffusion of erroneous doctrines respecting the nature of eczema and the method of its management, and because of the mischief resulting from the too common aggravation of the malady in its earliest manifestations, due largely, on the part of both physicians and laymen, to a lack of appreciation of the fact that an inflamed skin needs rest and protection as much as does any other similarly affected organ of the body.

2. RELIEF OF PRURITUS.—The itching, burning, and other sensations which accompany eczema are usually largely or entirely allayed by the complete protection of the skin from irritation. Antipruritics are, however, frequently desirable and necessary. Among the best are carbolic acid, hydrocyanic acid, camphor, menthol, and salicylic acid, each in the strength of 0.5 to 2 per cent. (rarely stronger) in lotions, ointments, jellies, pastes, etc. Saturated solutions of boric acid, or the lead-and-opium wash, answer in many acute cases. If a remedy does not relieve the itching, it should be changed for one that will, unless the fault lies in the method of application. The most common error in the use of local remedies is found in the five- and ten-minute, or longer, intervals during which the skin is not protected, either as a matter of convenience or with a view to its appearance or as a result of carelessness in removing and reapplying the dressings. Exposure to the air for a few seconds only of an acutely inflamed surface may be sufficient to arouse a violent attack of itching or burning. The relief of pruritus by the use of drugs internally is considered under the head of internal medication.

3. ANTISEPTIC DRESSING.—It is not known to what extent eczema may be due to, or may be modified by, the various micro-organisms that come in contact with the skin, but severe cases are undoubtedly complicated and prolonged by the action of such bacteria, and it is well in every case, when possible, to prevent their activity. Simple protection does much to accomplish this end, while, fortunately, most of the remedies used as antipruritics are also more or less parasitocidal. In certain forms of the disease, such as seborrhœal dermatitis, sulphur, resorcin, and other parasitocides are necessary.

4. RELIEF OF LOCAL CONGESTION.—This is accomplished by position, compression, internal treatment, and largely by the removal of external irritation. Occasionally a direct astringent action may be obtained by the use of lead-water, lime-water, or by some of the rapidly drying jellies or glycerogelatin preparations. In chronic eczema passive congestion is removed by means of stimulating washes, soaps, ointments, etc.

5. REPAIR OF THE EPIDERMIS.—If the preceding indications are

fulfilled, repair takes place naturally. It may be aided and hastened somewhat in suitable cases by the use of very mildly stimulating remedies, such as weak preparations of sulphur, resorcin, ichthyol, thiol, tar, etc. In chronic cases with much thickening of the epidermis the abnormally and imperfectly keratinized horny layer must be destroyed and removed before the process of repair can begin. For this purpose salicylic acid in ointment is especially valuable. Other remedies used for the purpose are tar, sulphur, resorcin, chrysarobin, pyrogallol, etc.

Local Treatment of Different Types and Phases of Eczema. 1. **Acute and Subacute Eczema.**—In selecting remedies for use on the acutely inflamed integument it is always best to begin with one that is mild and soothing, and to make the application to a small surface only, until it can be determined that the preparation will operate favorably in the case at hand. So greatly do individuals differ in their response to a given remedy that it is often well to order an alternative treatment in case the first does not prove satisfactory. A remedy that induces comfort and brings relief to the patient will usually do good, while one that irritates will almost invariably do harm.

CLEANSING OF THE SKIN.—In acute eczema the inflamed skin rarely tolerates pure water. The surface should be washed as little as possible, often not at all and this without soap and with soft water or with water that has been softened by the addition of borax, soda, bran, oatmeal, gelatin, or other demulcent, as outlined in the description of baths in the chapter on General Therapeutics. Hot water thus prepared and applied either as a lotion, a bath, a fomentation, or by sponging (without rubbing), cleanses the part, is frequently grateful, and alleviates the itching. When employed otherwise than as a fomentation its use should immediately be followed, as soon as the part is carefully dried, by the medicament selected for topical application. During the acute stages cleansing of the skin can usually be accomplished best by the use of olive- or other oil. For the removal of crusts and other accumulations a bland oil may be poured frequently over the surface with gentle inunction or be applied on lint or gauze. Even the oils, however, are at times sources of irritation. They are made more soothing if combined with an equal part of liquor calcis to form a liniment. The addition of 1 per cent. of carbolic acid makes the mixture antipruritic and mildly antiseptic. In many cases the value of these applications for the removal of crusts is greatly enhanced by surrounding the whole with oiled silk or other impermeable tissue. Such dressing should not be applied continuously for many hours at a time for fear of macerating and weakening the skin. Flaxseed, starch, or other poultices may in exceptional cases be applied for a few hours at a time to soften crusts and other accumulations on the surface. They should not be retained long enough to produce congestion and maceration of the skin.

POWDERS.—Powders are useful in acute erythematous or papular eczema, in intertrigo, and occasionally in vesicular forms of the dis-

ease. Applied to a discharging surface, powders tend to form coherent crusts which retain secretions and are therefore irritating to the skin. In early stages when the discharge is slight, powders will sometimes succeed in wholly arresting the secretion. For this purpose they are of special value in mild forms of intertrigo. To prevent friction of underwear upon the skin the meshes may be filled with a fine powder. In eczema of the hands the gloves may be treated in the same way. For absorptive purposes magnesium carbonate is effective. For use on dry surfaces zinc stearate, plain or combined with boric acid, salicylic acid, thiol, acetanilid, etc., is valuable on account of its lightness, and because it will adhere to any surface over which it is lightly rubbed with the hand. Among other excellent powders may be mentioned talcum, lycopodium, starch, rice-flour, bismuth subnitrate, zinc oxide, and calamin. The following formulæ are good:

℞	Acid. boric.,	3ij;	8	M.
	Talc.,	3vj;	24	
	Ol. ros.,	q.s.	q.s.	
℞	Acid. boric.,	3ij;	8	M.
	Zinc. stearat.,	3ij;	8	
	Talc.,	3ss;	16	
	Ol. amygdal. amar.,	q.s.	q.s.	

Anderson's powder and others containing camphor relieve pruritus better than the simpler powders, but are usually too stimulating and irritating for use in acute cases. In the preparation of dusting-powders it is of the utmost importance that they be made impalpable by sifting them carefully through silk bolting-cloth, as they are sources of irritation when they contain gritty particles. Only the best and finest grades of zinc oxide, talcum, calamin, and other powders should be employed, as many of the coarser grades found in the market cannot be rendered fine enough for use by any means at the command of the average chemist.

LOTIONS.—Lotions are among the most valuable preparations in acute and subacute eczema, and in some of the chronic forms of the disease. They are especially useful in moist eczema, where it is necessary to protect the surface and relieve the itching, and at the same time to avoid the retention of secretions by the dressing. The chief drawback to the use of a lotion lies in the necessity of its frequent application to prevent drying. This objection may be removed partially by the addition of 2 per cent. or more of glycerin or of tragacanth-mucilage. The effect of a lotion is further prolonged by the addition of some impalpable and inert or astringent powder, such as talcum, zinc-oxide, bismuth-subnitrate, or calamin. The powder, temporarily held in suspension by shaking the lotion immediately before each application, is left as a desposit upon the skin. A similar but less uniformly diffused effect is produced by the use of a dusting-powder immediately after the application of the lotion.

In moist eczemas a better method is to keep the lotion constantly applied on gauze or other material in the form of wet dressings. Great care must be exercised in the removal of such dressings after they have become dry, for fear of wounding the skin. An effective method is to put a single layer next the surface, which is removed but once or twice in twenty-four hours or only when soiled or stiffened by secretions, while a number of outer and thicker layers may be changed frequently in order to keep the dressing wet.

Lotions may be sedative, astringent, or stimulating. Many and varied formulæ are recommended, but a few only of the most useful and typical are given here, together with some suggestions as to their occasional modification. One of the most useful lotions, and one that is easily procured, is the following:

℞	Acid. carbolic.,	℥ij;	2 66	
	Zinc. oxid.,	℥j;	4	
	Glycerin.,	℥ij;	8	
	Liq. calcis,	q.s. ad ℥viiij;	q.s. ad 240	M.

The quantity of any one or all of the first three ingredients may be increased or diminished as desired. Where carbolic acid does not act favorably dilute hydrocyanic acid may be substituted. The zinc may be replaced partially or wholly by one of the other powders mentioned above. Glycerin is needed, where carbolic acid is an ingredient, to increase the solubility of the latter drug in the aqueous solution; otherwise tragacanth-mucilage may be used instead of glycerin, or both may be omitted and half of the lime-water be replaced by an equal quantity of elder-flower water. By the use of one or more of these suggested changes may be formed several compound zinc-oxide lotions; among the most desirable are:

℞	Acid. hydrocyan. dil.,	℥ss-℥ij;	2-8	
	Zinc. oxid., }	āā ℥j;	4	
	Calamin., }			
	Liq. calcis, }	āā ℥iv;	120	
	Aq. sambuci, }			M.

℞	Acid. carbolic.,	℥ss-℥ij;	2-8	
	Bismuth. subnit.,	℥j;	4	
	Tragacanth.,	gr. xl;	2 66	
	Liq. calcis,	q.s. ad ℥viiij;	q.s. ad 240	M.

Occasionally neither carbolic acid nor hydrocyanic acid has the desired antipruritic effect, even when increased in strength to 5 per cent., or both may be contraindicated for some reason. In such cases from 1 to 3 per cent. of menthol, camphor, or chloral may be added, with sufficient alcohol to hold them in solution. With these additions however, the lotion becomes more or less stimulating and must be used in acute cases with caution.

The lead-and-opium wash is as useful as the various zinc oxide lotions, and in weeping cases with burning or hyperæsthesia is usually more acceptable:

℞ Tinctur. opii, 3ss; 15|
 Liquor. plumbi subacetat. dilut., q.s. ad 3viij; q.s. ad 240| M.

To this may be added, as in the case of the zinc oxide lotion, glycerin, boric acid to saturation, zinc oxide, or other powder to be left on the skin as a deposit, or from $\frac{1}{2}$ to 1 ounce (15. to 30.) of tincture of camphor if this is well tolerated and a more decided antipruritic effect is desired.

A saturated solution of boric acid to which has been added 2 per cent. or more of glycerin or tragacanth-mucilage is an excellent application in moist eczema, and especially in suppurating forms. A weak solution of potassium permanganate is both antiseptic and antipruritic. Black wash, pure or diluted, is effectual in many moist forms of eczema, as are 1 to 10 per cent. solutions of ichthyol and thiol. Excellent lotions for soothing effect are made by adding 1 to 2 drachms (4.-8.) of sodium bicarbonate or biborate to a quart (1000.) of thin oatmeal-gruel or of marshmallow-decoction. For a dry, irritable, and itching eczema, Boeck recommends the following:

℞ Tale., }
 Amyli, } āā 3ij; 60|
 Glycerin., 5vj; 24|
 Liq. plumb. subacet. dil., 3iv; 120| M.

This is to be diluted with 2 parts of water, and applied with cotton or a brush. This lotion is decidedly cooling, but is not indicated in moist eczema.

Any one of the zinc-oxide lotions described above may be combined with an equal quantity of almond-, olive-, or other oil to form a liniment. These combinations are especially good in acutely inflamed surfaces of considerable extent, when it is desirable to avoid a drying effect. The popular carron oil, composed of equal parts of linseed oil and lime water, is often objectionable because of the tendency of the oil to dry and form a dense coating upon the skin to which it is applied.

For subacute and indolent stages of eczema and for some acute cases, mildly stimulating and stronger antipruritic lotions containing tar, carbolic acid, menthol, camphor, chloral, and alcohol may be used. They should be tried cautiously and diluted at first. As a rule, they give best results when applied for a few moments several times a day, the part being kept covered in the interval with an ointment or other protective dressing. The following formulæ, which may be modified to suit individual cases, are to be recommended:

℞ Acid. carbolic., 3iss-3ss; 6-15|
 Glycerin., 3ij; 8|
 Menthol., 3j-3ss; 4-15|
 Spirit. vin. rect., q.s.;
 Aq. destill., q.s. ad 3viij; q.s. ad 240| M.

℞ Liq. picis alkalini, 3ss-3ij; 2-8|
 Glycerin., 3ij; 8|
 Aq. destill., q.s. ad 3viij; q.s. ad 240| M.

Liquor carbonis detergens, or Duhring's compound tincture of coal tar (these preparations are described under Chronic Eczema) may be substituted for the liquor picis alkalinus. Hutchinson recommends the following in dry, subacute eczema:

℞	Liq. plumb. subacet.,	3ss;	2	M.
	Liq. carb. detergentis,	3ss;	2	
	Aq. destill.,	q.s. ad ʒviij;	q.s. ad 240	

ointments.—Ointments are not, as a rule, well tolerated by an acutely inflamed skin, and are commonly more useful in subacute and chronic eczema, but there are many exceptions to the rule, and occasionally even an acute vesicular eczema is best relieved by use of an ointment. These should be properly and freshly prepared, and the débris of one dressing should be carefully removed before another application is made. Strata of an ointment, the older next the skin possibly rancid and having imprisoned beneath them pus or other products of disease, are a source of positive harm. In acute, and especially in weeping, eczemas an ointment is best applied by spreading it evenly on gauze, lint, or other soft material, which can then be laid upon the part. The *salve-muslins* devised by Unna furnish an excellent substitute for ointments; they are clean and effective, and in every way admirable if they can be procured fresh.

Among the best ointments for use on the acutely inflamed skin is the well-known diachylon ointment of Hebra. It is prepared as follows: to 14 ounces (420.) of the best olive-oil are added 1 pound (480.) of water, and the whole heated to boiling on a water-bath; 3 ounces and 6 drachms (114.) of finely powdered litharge (oxide of lead) are sifted slowly into the liquid, which is then boiled and stirred constantly until all particles of litharge have disappeared and there is formed a perfectly homogeneous mass. During the cooking, water is occasionally added as required, and the whole evaporated to the desired consistence. The stirring is to be continued until the ointment is cold. While the mass is cooling 1 drop of oil of roses or of oil of lavender is added to each 2 ounces of ointment. When properly prepared the Hebra ointment is perfectly homogeneous, is of a light-yellowish color, and is of the consistency of butter. It is technically known as the "*Unguentum diachyli albi*" of Hebra. The simple ointment often becomes rancid in two or three weeks, but it may be preserved for months by the addition of 0.5 per cent. of carbolic acid or formalin.

Duhring has modified this ointment as follows: 1 part of pure dry lead oxide is rubbed down with 1 part of water, and well mixed with 8 parts of the best olive-oil. The mixture is stirred for about two hours over a water-bath near the boiling-point, and is then cooled with constant stirring until the proper consistence is obtained. The ointment has been modified by Piffard also, and after him by Kaposi, in combining equal parts of lead-plaster and vaselin. It may be imitated fairly well by melting together 3 or 4 parts of olive-oil and 4 of diachylon plaster, and stirring until cool.

The Hebra ointment, though useful often in full strength and even to the exclusion of other pomades, may often be combined with others with manifest advantage. Thus, 1 or 2 drachms (4.-8.) of it may be added to the ounce (30.) of lard, cold-cream salve, or cerate, with or without the addition of another drachm or two (4.-8.) of zinc oxide ointment.

The official zinc-oxide ointment is an acceptable preparation in many acute cases; equal parts of this and the Hebra ointment make an excellent combination. Any one of these ointments may be reduced with from one to three times its volume of lanolin, vaselin, or cold-cream salve. The following formula gives an excellent soothing and protective ointment:

R	Bismuth. oxid.,	3j;	4	
	Vaselín., }			
	Ol. oliv., }	āā 3j;	30	
	Ceræ alb.,	3iij;	12	
	Ol. ros.,	q.s.	q.s.	M.

Other bland and soothing ointments may be made by combining in various proportions cold-cream salve, lanolin, vaselin, lard, and simple cerate. The cerates are made sufficiently soft for gentle manipulation by adding 1 to 2 drachms (4.-8.) of glycerin or oil to each ounce (30.) of ointment, and they may be flavored with lavender, rosemary, or bergamot, as preferred. These simple bases may be stiffened and rendered somewhat astringent by the addition of from 10 grains to a drachm (0.66 to 4.) or more of bismuth subnitrate or subcarbonate, zinc-oxide, or calamin to the ounce (30.). A very thin base may be prepared by mixing equal parts of lanolin, olive-oil, and glycerin. This is especially valuable for use on hairy surfaces. A creamy and cooling base is Unna's "refrangent ointment," which contains lanolin, 10; lard 20, and rose-water, from 30 to 60 parts. Any of the above bases may be medicated as desired; the most frequent addition being from 5 to 10 grains (0.33-0.66) of carbolic, boric, or salicylic acid, or a similar quantity of calomel or white precipitate to the ounce (30.) of salve. With these unguents may be named glycerole of starch, cucumber ointment, emulsion of sweet almonds, decoction of Irish moss, and Hardy's formula—2 parts of zinc-oxide, 8 of glycerin, 30 of cold-cream salve, and 15 drops of tincture of benzoin.

The oleate of bismuth or of zinc is prepared by rubbing up 1 drachm (4.) of the oxide of either metal with 8 (30.) drachms of oleic acid, and allowing the mixture to stand for two hours. It is afterward heated on a water-bath, where 10 drachms (40.) of vaselin and 3 (12.) of wax are dissolved in it, and the whole stirred until cold. This ointment is especially useful when employed in papular forms of eczema. In pustular eczema ointments containing iodoform, boric acid, iodol, aristol, or euophen are indicated.

THE COMBINED USE OF LOTIONS AND OINTMENTS will often

give good results. The black wash as recommended by Duhring, White, and others is often effective in acute vesicular eczema. The part is bathed for fifteen or twenty minutes two or three times a day with the wash, the sediment allowed to remain on the skin, and the whole covered with a piece of gauze or soft cloth on which has been spread a thick layer of zinc-oxide or other simple ointment. The lead-water or the zinc-oxide lotions may be used in the same way with simple ointments or pastes.

PASTES.—Pastes are especially valuable in subacute eczema, and are often tolerated in acute forms better than an ointment. A thick paste is rarely indicated in moist eczema, as it prevents escape of the discharge from the surface. Pastes are more cleanly and adhesive, furnish better protection, are more drying, and require less frequent applications than ointments. They are formed by combining a simple powder, usually insoluble, with an ointment-base, the proportions of the two being so adjusted as to produce a more or less stiff, somewhat tenacious, mixture which may be spread as a protective covering directly upon the skin. The following paste recommended by Lassar may be taken as a type:

R	Amyl.,	5ij;	8	
	Zinc. oxid.,	5ij;	8	
	Vaselin.,	3ss;	15	M.

The substitution of talc for the starch in the above gives a paste with less tendency to concrete in lumps on the skin. Boric acid used in place of the starch, produces a stiff and adherent paste. A very smooth and pleasant combination, and one that is also fairly stiff and adherent, is made of equal parts of talc, zinc-oxide, vaselin, and lanolin. These pastes serve as bases to which various medicaments may be added. Those most commonly used in acute and subacute eczema contain boric, salicylic, and carbolic acids, in the strength of from 1 to 5 per cent.; calomel, white precipitate, ichthyol, and thiol in similar proportions. Other remedies may be employed according to the indications. The following is an adherent and drying paste:

R	Lanolin.,	3ij;	60	
	Paraffin.,	3ij;	30	
	Ceræ alb.,	3ij;	4	
	Aq. destill.,	3j;	30	M.

The lanolin, paraffin, and wax are thoroughly mixed before the water is added. A good drying and soothing paste, recommended by Morris, is made of equal parts of almond- or olive-oil, lime-water, and zinc-oxide. Unna recommends a paste prepared by mixing 1 ounce (30.) of zinc-oxide with 2 ounces (60.) each of glycerin and an official mucilage. To either of these pastes may be added 1 per cent. of carbolic or salicylic acid. Other good bases are found in Elliot's bassorin-paste,¹ or Unna's gelanthum, both of which are described in the chapter on General Therapeutics.

¹ J. C. D., 1891, ix., p. 48, and 1892, x., p. 184.

GLYCOGELATINS.—These render excellent service in all dry forms of eczema, in which simply protection is required. Certain remedies may also be incorporated, such as 1 or 2 per cent. of ichthyol or thiol. A convenient formula is the following:

℞	Gelatin. alb., }	āā 3j;	30	
	Zinc. oxid., }			
	Glycerin.,	3jss;	45	
	Aq. destill.,	3iij;	90	M.
℞	Gelatin. alb.,	3ijss;	10	
	Zinc. oxid.,	3v;	20	
	Glycerin.,	3j;	30	
	Aq. destill.,	3x;	40	M.

The ingredients are mixed on a hot water-bath and when cool and solidified may be cut in pieces of convenient size for use. Before application a sufficient quantity is melted in a dish placed in a receptacle containing water which is heated to a suitable degree; the liquefied material is then applied with a brush, care being taken that it is not uncomfortably hot for the patient. It dries somewhat slowly and it is well after two or three minutes to pat the surface with cotton or to cover it completely with gauze. By increasing the quantity of glycerin a softer and more slowly drying preparation is formed. By lessening the quantity of glycerin and increasing that of the zinc-oxide or gelatin a firmer and more rapidly drying product is obtained. Though these glycogelatins serve their best purpose in the dry forms of the disease, there are few forms of eczema in which they may not at times be used with benefit.

In subacute and indolent types **PICK'S GELATIN SUBLIMATE** is useful. This is prepared by mixing 30 grammes (5i) of gelatin with sufficient water to liquefy it on a water-bath, and evaporating to 75 grammes (3ijss); 25 grammes (3vj) of glycerin and 5 centigrammes (gr. $\frac{5}{8}$) of corrosive sublimate are then added. The product must be melted before applying.

In acute erythematous eczema **PICK'S TRAGACANTH VARNISH** ("linimentum exsicicans") is a very acceptable remedy in that it is easily applied without heating, dries quickly, is clean, and distinctly cooling. It is composed of tragacanth, 5; glycerin, 2; and boiling water, 93 parts. To this may be added from $\frac{1}{2}$ to 2 per cent. of boric or carbolic acid, or from 2 to 5 per cent. of some simple powder, such as zinc-oxide. The tragacanth must be soaked for several hours in a part of the water and thoroughly triturated before the other ingredients are added. Stelwagon¹ prefers a varnish containing zinc oxide, 2 parts; glycerin, 1 part; and mucilage of acacia, 5 to 8 parts, as it dries quicker than the tragacanth preparation.

Subacute Eczema.—Attention has already been called to the fact that no sharp line can be drawn between acute, subacute, and chronic

¹ Diseases of the Skin, 5th ed., p. 289.

eczema, the degree of inflammation in any given case varying from time to time. Most acute cases, however, are followed by a longer or shorter period of subacute or chronic inflammation. In proportion as the disease progresses to the subacute or chronic stage the various topical medicaments employed may be changed in character so as to produce an astringent or stimulating effect upon the part. The utmost skill and prudence, however, are needed at this juncture, and changes should be made cautiously, for it is at this time that the disorder is readily awakened to renewed activity, a turn of affairs which is especially annoying to the patient, and particularly so to the practitioner if there be a suspicion (often too well founded) that the aggravation has been due to the treatment.

Again, many cases of eczema are subacute and indolent from the beginning, yet are liable at any time to present acute manifestations; consequently in beginning the treatment of an apparently subacute case it is well to use mild measures first, gradually changing to those stronger and more stimulating.

The treatment of subacute eczema varies from that of the acute type chiefly in demanding more stimulating remedies and those having a greater antipruritic effect. For this purpose many of the substances already recommended for acute eczema may be employed, but in increased strength. In this phase of the disorder pastes are especially valuable, as are also the glycogelatins, though occasionally lotions and powders produce the best results. On the other hand, cases occur in which ointments make the best applications. When milder measures will not succeed in a given case the stronger remedies recommended for chronic eczema should be employed.

Chronic Eczema.—The general principles of local treatment of chronic eczema are those of the acute form of the disease except that stronger and more stimulating remedies are used. It must be remembered that many chronic eczemas are subject to acute exacerbations, when milder and soothing treatment must be adopted for a time. Moreover, chronic eczema appears in such varied phases in different individuals, and in the same individual in successive attacks, that it is impossible to select certain formulæ and declare that these will be of benefit in a given type of the disease. It is only by careful observation of the general principles and objects of the treatment of eczema, discussed in the preceding pages, that the varied conditions can be successfully treated.

CLEANSING OF THE SKIN.—This should be accomplished according to directions already given, by means of oils or liniments, though in chronic eczema more vigorous measures can frequently be employed, including the occasional use of soap and water, some densely infiltrated patches tolerating and even being benefited by a daily washing. For this purpose a good toilet-soap, or, when the skin will permit, tincture of green soap, may be used. The Sarg glycerin soap is an admirable substitute for these articles when the skin is

tender and where an elegant toilet-preparation can be ordered. The crusts and scales once removed, subsequent topical applications can be made as required in each case.

POWDERS.—Powders are useful in chronic as in acute eczema for mechanical protection, to prevent friction between apposed skin-surfaces or between the skin and clothing. They are often of value when dusted and patted over a paste, thus making a thicker and more cleanly dressing, and one less likely than a paste to be rubbed off. The Anderson and other antipruritic powders are frequently serviceable for application during the day, when other dressings cannot well be employed on account of the patient's occupation.

LOTIONS.—Lotions are of less value than in acute eczema, but are often useful for temporary purposes after the skin has been unduly irritated by other dressings. Stimulating lotions or solutions are sometimes painted on the skin and allowed to dry, or are used for a few minutes each day, the surface in the intervals being covered with an ointment.

OINTMENTS.—Ointments are the preparations most used, especially in the dry, scaling forms of the disease, in which penetration of the remedy is desired. To serve this end, they should be gently rubbed into the surface, which is later covered with more of the same ointment spread on gauze or a soft cloth.

PASTES.—Pastes often answer better than ointments, especially when protection and drying of the surface are the chief objects of treatment. In combination with powders, as described above, they furnish convenient and effectual applications in most cases of chronic eczema. In many dry forms of the disease either plain or medicated *Glycogelatins* furnish the best application. They are of special value in dispensary and other cases in which the physician does not wish to entrust the dressing to the patient, as a gelatin-dressing may often be left in place for several days or a week. For the application of tar, chrysarobin, salicylic acid, and a few other remedies to small areas, *Collodion* and *Fluid Gutta-percha* (*Traumaticin*) form convenient and cleanly vehicles.

Applications in chronic eczema, as a rule, should be more antipruritic and more stimulating than in acute and subacute phases of the disease. The remedies recommended above may be used in increased strength. This is especially true of the drugs classed as antipruritics, such as carbolic acid, creosote, camphor, menthol, and chloral.

Salicylic acid is one of the most useful remedies in chronic eczema. It is antipruritic and is effective in destroying thickened areas of dry horny epidermis. It may be incorporated in the strength of from 2 to 10 or even 20 per cent., in most of the ointments, pastes, and plasters recommended in the preceding pages. In the glycogelatins more than 2 or 3 per cent. cannot be used without the addition of a fat, preferably 5 per cent. of fresh lard. For small areas of infiltration with marked thickening of the horny layer salicylic

acid is best used with Duhring's modifications of Pick's "salicylated soap plaster." The acid has a tendency to soften the plaster if employed in strength above 5 per cent. The formulæ are as follows:

℞	Emplast. saponis (U. S. P.) liquefact.,	3iij;	90	
	Olei olivæ opt.,	f3ij;	8	
	Acid. salicylicæ,	3ss;	2	M.

For a 5 per cent. plaster:

℞	Emplast. saponis (U. S. P.),	3j;	30	
	Olei olivæ,	℥xxiv;	1 60	
	Acid. salicylicæ,	gr. xxiv;	1 60	M.

For a 10 per cent. plaster:

℞	Emplast. saponis (U. S. P.) liquefact.,	3j;	30	
	Acid. salicylicæ,	gr. xlv;	3	M.

For a 20 per cent. plaster:

℞	Emplast. plumbi (U. S. P.),	3j;	30	
	Ceræ flavæ,	gr. xlv;	3	
	Acid. salicylicæ,	gr. xc;	6	M.

Plasters made according to the above formulæ are adhesive, and are firm enough to be moulded and kept in rolls. For large surfaces they should be warmed before applying to make them spread easily. Resorcin and other remedies may be substituted for salicylic acid, but resorcin has a tendency to stiffen the plaster and requires the addition of oil. Unna's salicylated gutta-percha plaster-mulls make excellent substitutes for the above, but to be serviceable they should always be fresh.

TAR.—This is one of the most valuable remedies, when tolerated by the skin, for the treatment of chronic eczema. The preparations most commonly employed are *pix liquida* (pine-tar), *oleum rusci* (oil of white birch), *oleum cadinum* (oil of cade), and *terebinthina Canadensis* (balsam of fir). Oil of cade, as found in most of the shops, is inferior to *oleum rusci*. The tars are best applied in the form of ointments, but are occasionally painted over the affected surface in a liquid state with a camel's-hair brush. From $\frac{1}{2}$ to 2 drachms (2.–8.) of tar, in combination with a suitable quantity of potassium subcarbonate, are sufficient to add to 1 ounce (30.) of ointment, the proportions suggested being varied to suit the requirements of each case.

In beginning the use of tar with any individual, weak preparations should first be employed, and the strength be gradually increased until tolerance of the skin is determined, as an acute dermatitis not infrequently follows the application of stronger preparations. A convenient method is to order one jar of a fairly strong tar ointment, and another of the zinc-oxide, the Hebra, or other simple salve. Before the first application the patient takes a sufficient quantity of the simple ointment and mixes with it a very small proportion of the tarry preparation. If no irritation follows this application, the amount of tar can be gradually increased with each dressing until

enough is used to relieve the itching and to reduce the infiltration, after which a simple paste or powder may be employed until the skin has regained its normal strength and resistance. If the application at any time causes an acute dermatitis, simpler remedies for a time must be substituted. To accomplish the best results, tar ointments should be rubbed well into the skin or liquid preparations painted on. Sometimes it is well to permit the application to accumulate until thrown off by exfoliation, but it is better to cleanse the skin with oil or with soap and water, according to indications, before each application.

The following formulæ are illustrations of the manner of compounding the various preparations of tar:

℞	Ol. rusci (vel cadini),	5ss-3iij;	2-12	
	Potass. bicarbonat.,	℥j-5ss;	1.33-2	
	Unguent. aq. ros.,	3j;	30	M.
	Ft. ungt.			

For the potassium bicarbonate $\frac{1}{2}$ to 1 drachm (2.-4.) of zinc-oxide may be substituted, or from 2 to 4 grains (0.133-0.266) of red mercuric oxide, or yet $\frac{1}{2}$ scruple (0.66) of mild chloride. The vehicle, also, of such ointments may be vaselin, lanolin, simple cerate, or $\frac{1}{2}$ ounce (15.) of either in combination with an equal quantity of diachylon ointment.

Of fluid preparations may be mentioned alcoholic solutions of tar, $\frac{1}{2}$ ounce (15.) of the latter to the pint (500.) of alcohol; and in cases in which the detergent action of soap is also needed *sapo viridis* may be added as follows:

℞	Picis liquidæ,	f3j-3ij;	30-60	
	Sapon. virid.,	f3jss-3iij;	45-90	
	Glycerin.,	f3j;	30	
	Spt. vin. rectific.,	f3viiij;	240	
	Ol. rosmarin.,	f5ss;	2	M.
	Sig.—To be rubbed gently into the skin with a flannel rag.			

Bulkley devised an alkaline solution of tar and caustic potash, which is especially serviceable, as it is miscible with water in all proportions. It is constituted as follows:

℞	Picis liquidæ,	f3ij;	60	
	Potassæ causticæ,	3j;	30	
	Aq. destillat.,	3v;	150	M.
	Dissolve the potash in the water, and add slowly to the tar in a mortar with friction.			
	Sig.—“Liquor picis alkalinus.” To be used diluted as a lotion.			

Of this solution 1 drachm (4.) or more may be added to a pint (500.) of water. For an ointment, the same quantity of the solution may be added to the ounce (30.) of cold-cream salve, lanolin, or vaselin. It should be remembered, however, that the caustic alkali renders this preparation exceedingly irritating to a sensitive skin, and it should be employed with caution upon any untested surface.

An excellent fluid preparation is Duhring's "compound tincture of coal-tar," prepared according to the following formula: "Coal-tar (1 part) should be digested with tincture of quillaja (6 parts), with frequent agitation for not less than eight days, preferably for a longer period, and finally filtered. The resultant product is a brown-black tincture which, upon the addition of water, forms a cleanly yellowish emulsion, the color and certain other characters varying with the variety of coal-tar used. The strength of the tincture of quillaja should be 1 to 4 with 95 per cent. alcohol." Five to fifteen minims to the ounce (0.33–1. to 30.) of water is the strength recommended for use.

The formula recommended by Spender, and described in the chapter on General Therapeutics, is a useful means of testing the efficacy of tar upon an eczematous surface. Olive-oil or cod-liver oil may be combined with equal parts of one of the tarry preparations and rubbed into the eczematous skin. When fluid or semifluid compounds of tar are needed upon the scalp 1 drachm (4.) of the article selected may be rubbed up with an equal quantity of glycerin and added to 6 ounces of cologne-water (180.). Creolin is very similar in its action to tar and is miscible with water.

Hebra disclaimed any special value for sulphur in eczemas uncomplicated by the *acarus scabiei*, but in Wilkinson's and other ointments it serves a good purpose. The following formula supplies an ointment rather less severe than has practical efficacy in chronic eczema:

R	Picis liquid. (vel. ol. rusci),	ʒiv;	120		M.
	Adipis,	ʒj;	30		
	Ol. olivæ,	ʒss;	15		
Misce et adde:					
	Terebinth. Canadens., }	aa ʒj;	aa 30		
	Sulphur. flor., }				

Sig.—To be applied three times daily with a soft brush.

To this formula may be added green soap if a stronger effect is desired.

Ointments and pastes containing 10 to 30 grains (0.66–2.) of sulphur, and 5 to 15 grains (0.33 to 1.) of salicylic acid in similar proportions often give good results in circumscribed, infiltrated patches of eczema which show tendencies to occasional moisture and crusting. Ointments containing from 1 to 4 per cent. of sulphur favor keratoplasia.

Ichthyol and thiol, in ointments of the strength of 10 per cent. and less, or in aqueous lotions containing from 5 to 50 per cent. of the drug, are useful in localized patches of the disease, especially of the papular and scaling varieties. Ammonium ichthyolsulphonate is preferable to the sodium compound. Its influence upon the skin seems to resemble both that of the tars and of chrysarobin. Unna's varnish containing ichthyol is convenient, as it dries rapidly and is easily re-

moved by washing. It is prepared as follows: 40 parts of starch are mixed with 100 parts of water, to which are added 40 parts of ichthyol; after thorough trituration there are added $1\frac{1}{2}$ parts of a concentrated solution of albumin which should be prepared at a temperature low enough to prevent coagulation.

Other remedies which may be added to ointments, pastes, or plasters in strength varying from 1 to 10 per cent. for the treatment of chronic eczema are: resorcin, chrysarobin, pyrogallol, calomel, and white precipitate. Occasionally systemic intoxication has followed the use of these remedies over large surfaces, and they are adapted best to employment on small areas. The three first named stain the skin and clothing. Other preparations of mercury may be employed with advantage in some cases.

In persistent areas with marked infiltration of the skin radiotherapy often gives excellent results. We have found it of value most frequently in the dry scaling forms of the disease, but it is indicated also in moist forms with infiltration, and especially in cases in which suppuration is present. The technique is the same as that recommended for psoriasis.

An effective method of treating circumscribed thickened patches of eczema is the following: a piece of green soap as large as a walnut is spread upon a flannel rag, and rubbed into the eczematous part for several minutes, pressing firmly the while, and from time to time dipping it into water in order to produce lather. The duration and firmness of the rubbing depend chiefly upon the amount of infiltration present, but to some extent upon the general condition of the skin. The production of an acute dermatitis by too severe treatment should be avoided. Following the soap-rubbing the part is washed free from suds with water, carefully dried, and the oil or ointment selected for topical use immediately applied on strips of muslin, which are neatly bandaged to the part. Hebra's diachylon ointment is one of the best for this purpose. The soap must be rubbed in at least twice every day, so long as any excoriated points appear after its application. Soap rubbed into the healthy skin will not be followed by such effects, the part feeling clean, smooth, and comfortable after it has been washed. The contrast this offers to the eczematous patch is very striking, the latter representing numerous intensely red, raw, and moist spots. The appearance of these red, shining, moist points after the first inunction suggests to the inexperienced eye that the malady has been aggravated; but they become fewer in number after each application, and finally disappear, the eczematous surface being then no more affected by the soft soap than is the surrounding healthy skin.

Many circumscribed patches of chronic eczema are greatly benefited by daily painting with a saturated solution of pyoktanin-blue. It is usually unproductive of pain, and, as it forms a thin film over the surface to which it is applied, probably serves a good purpose for the time being by the exclusion of air. It acts also as a parasiticide. The chief objection to its employment lies in the staining it produces

not only of the skin, but also of all articles brought into contact with it.

Among the more severe measures occasionally employed for small patches of eczema which resist milder treatment may be named: cantharides employed as a blister, silver nitrate in crayon or in solution, from 3 to 60 grains to the ounce (0.20—4. to 30.), and iodine in combination with carbolic acid. The following formula should furnish a clear vinous-red fluid, which may be applied pure or in dilution:

Rx	Iodin. tinct.,	3ss;	2
	Acid. carbolic. (cryst.),	3j;	4
	Glycerin., }	āā 3ij;	āā 8
	Alcoholis, }		
	Aq. destillat.,	ad f3j;	ad 30 M.
Sig.	Iodized solution of carbolic acid.		

In cases in which there is considerable pruritus, especially in obstinate patches of papular eczema, the iodized phenol of Bellamy may be substituted for the above. The formula is:

Rx	Acid. carbol., }	āā 3j;	āā 4
	Iodini cryst., }		
	Combine with gentle heat and add an equal part of glycerin.		
Sig.	Iodized phenol; to be applied twice daily with a glass rod.		

Prognosis.—Eczema is an entirely curable disease, but uncertainty attends its prognosis as regards the duration of an attack and the probability of a relapse. With respect to the questions most frequently asked, those relating to contagion, heredity, and persistent lesion-relics, a favorable response can be made; but the fact remains that some forms of the disease are insignificant, some persistent, and some particularly liable to recurrence from very slight provocation. Only after careful weighing of all the conditions exhibited by the skin and by the other organs can a reasonable probability as to the future of the disease be estimated. Eczema is a disease exceedingly common, and one subject to aggravation by causes well-nigh innumerable. Were the physician always in position absolutely to insure his patient a proper mode of living, and the exclusion of all sources of irritation of the skin, the prognosis would be much more satisfactory. In hospital-patients, over whom such control is more perfectly attained, the results of treatment may be predicted with some confidence.

In general, it may be said that acute eczema is more readily relieved by proper treatment than are the chronic forms of the disease; that eczema with a discoverable cause is more manageable than one the etiology of which is obscure; that eczema of the very young and of the very old is at times particularly rebellious; that the non-discharging phases of the disease are rather more persistent than those accompanied by secretion; that eczema lingering at the mucous outlets of the body (auditory canal, nostrils, mouth, nipple, anus, vagina) is more obstinate than when it affects the skin of other parts

(shoulder, neck, lumbar region); that eczema with constant aggravation or complications (fissure of skin of hand, varicose veins of leg, apparatus for ankylosis) is more stubborn in proportion as these complications or aggravations cannot, from the circumstances of each case, be set aside; and, finally, that an eczema which has long existed, or has repeatedly recurred, as, for example, with every season of extremely cold or hot weather, is, after relief, very liable to return. The parasitic eczemas are particularly amenable to treatment.

TOPICAL AND SPECIAL VARIETIES OF ECZEMA.

Eczema of Children.—Inflammation of the skin in infants and young children is usually acute in type, owing to the delicate structure of the skin and to the tendency in childhood to acute rather than subacute and chronic pathological changes in the various organs of the body; consequently the eczema of infants is commonly vesicular, pustular, or vesiculo-pustular in expression. Though acute in type, eczema of young children is frequently chronic in duration; a child for example of two, three, or four years of age may have had the disease in varying degrees and extent since a few weeks after its birth. In these persistent cases there may be considerable thickening and infiltration of the skin, and periods during which the symptoms are those of a subacute or chronic process; but acute manifestations recur at frequent intervals and usually predominate.

The causes peculiar to eczema of childhood are found in the ease and frequency with which the delicate skin is injured by external agents, such as soap, hard water, rough clothing, dirt, pathological secretions, etc., together with the rubbing and scratching that follow pruritus from any cause; in the presence of toxines in the blood, resulting from deficient elimination or from imperfect metabolism and assimilation of food, due commonly to improper or irregular feeding, and from various systemic diseases; in the so-called reflex irritation arising from dentition; and in the local infections of the skin with pus-cocci and probably at times with other micro-organisms.¹ According to statistics gathered by Crocker, more than one-third of all cases of eczema in children begin during the first year of life.

Treatment.—Success in the treatment of these young patients depends, first upon the painstaking search for, and removal of, the causes; and secondly, upon the care with which the principles of treatment of acute eczema, already set forth, are carried out in all details. Special attention should be given the question of diet and every effort should be made to prevent auto-intoxication of intestinal origin. In the local treatment gentle measures should be the rule. The theory that systemic injury and even death may result from a too vigorous treatment of infantile eczema is advocated by a number of observers.² Post mortem examinations made in lethal cases have

¹ Cf. Hall, B. J. D., 1905, 17, Nos. 5, 6, 7 and 8, and *ibid.*, 1908, 20, pp. 4-11.

² Cf. Rey, *Centralblatt für Kinderheilkunde*, 1902, ref. *Archiv*, 1904, lxxviii., p. 309, and *Korrespond. für Schweizer Aerzte*, 1904, No. 1, ref. in *Archiv*, 1905, lxxiv., p. 126.

shown death to have been due in some instances to a status lymphaticus, in others to cardiac degeneration probably arising from the prolonged absorption of toxines from the eczematous surface.

Eczema of the Scalp (*Eczema Capitis*, *Eczema Capillitii*).—When the scalp is affected with eczema the symptoms differ somewhat according to the age of the patient. In adults the erythematous and squamous varieties of the disease are more common; in infants and children the pustular variety. In the former the eruption is usually circumscribed and in patches; in the latter it is more diffused. In the same proportion, also, the former is generally asymmetrically and the latter symmetrically developed.

In infants and children the pustules rupture early and their contents dry into dirty-whitish, yellowish, or greenish crusts, matting the hairs, thus serving as foci for dust-accumulation and as nests for lice, the crusts being superimposed upon a reddish, oozing, pus-covered, or occasionally indolent skin, often foul-smelling, and usually complicated by a seborrhœa. The so-called "milk-crust" is usually a compound of dried pus and altered sebum. The itching is not so intense as in some other forms of the disease. Post-cervical, pre-auricular, and occipital adenopathy are common, and in strumous children supuration of the affected glands may occur. The causes of this form of disease are evidently associated with local conditions. The rapidly growing hairs of the scalp are in intimate association with the numerous and large sebaceous glands of the same part, which at times unquestionably respond by an exudative process when a relatively slight external irritation is added to the physiological stimulus they feel. Such local irritants are often not wanting to push the disturbed equilibrium into the scale of disease. White calls attention to the common neglect in removing the "pre-natal cap of cheesy material" as well as to rude and unskilful attempts to accomplish the same end. Extremes of temperature, friction, excess, neglect, and absence of endeavor to wash the scalp, all these contribute to originate or to aggravate the disorder.

The affection when complicated or induced by lice is more common in children than in infants, doubtless in consequence of the greater independence of the former and their gregarious habits. In girls with relatively long hair the ova, or nits, of the parasite are readily distinguished, adhering closely to the hairs, and accumulated especially about the occipital region. The itching is usually more annoying than in pustular eczema not thus complicated.

The erythematous and squamous forms of the disease, rather more common in adults, originate frequently in seborrhœa when scratching has been practised or irritant applications have been made. The eruption here usually occurs in asymmetrical patches, or it may be limited to a single patch tolerably well defined in outline, often upon one side of the scalp, not, as in infancy, preferring the vertex.

The diagnosis of these forms of disease has been already considered. The disorders most commonly confused with eczema of the scalp are psoriasis, seborrhœa, tinea favosa, and tinea tonsurans.

Treatment.—In the treatment of eczema of the scalp in infants and children the first indication to be met is the removal of the accumulated crusts. When this removal is harshly accomplished it becomes a fruitful source of further mischief; it is, therefore, necessary to proceed with great gentleness. The thorough softening of the crusts is all-important. For this purpose it is necessary to soak them with oil and to retain this substance in intimate contact with the scalp. Olive- or cod-liver oil may be selected, and, if needful to correct the odor or for other purpose, 1 drachm (4.) of carbolic acid may be added to each pint (500.), with 2 drachms (8.) of the balsam of Peru. A neat-fitting skull-cap, constructed of suitable impervious material, should then be applied smoothly, and fastened in place by a light bandage, never by elastic-rubber bands. After several hours of soaking the crusts should be removed with warm water and spirit-of-soap washing, and the entire process be repeated until the crusts are completely detached. In selecting an article for subsequent medication of the scalp it should be remembered that even infantile eczema will proceed to a natural involution if unirritated; hence oleated lime-water, or oil of sweet almonds alone, will often answer better than an ointment, and, even where there is considerable acuity of the inflammatory process, lime-water alone, with possibly a small quantity of glycerin added, will be effective. As the discharge and crusting cease ointments instead of oils and lotions may be employed. The ointment is to be rubbed gently over the surface with the tip of the finger, and the skin afterward protected with suitable dressing, such as a gauze-cap. Good ointment-bases for use on the scalp are lanolin, vaselin, equal parts of lanolin and oil, or equal parts of glycerin, lanolin, and oil. The following remedies may be incorporated in strength varying from 1 to 5 per cent.: carbolic, salicylic, and boric acids; calomel, white precipitate, ichthyol, sulphur, resorcin, and tar. In children and in acute cases strong preparations must not be used. When the seborrhœal element is at all pronounced the treatment is that of seborrhœal dermatitis.

It is rarely needful to cut the hair unless nits be found, though in public charities it is a more expeditious method of arriving at the end when a nurse has to dress the heads of several children in a single ward. Lice when present may be destroyed by the application of petroleum, bichloride lotions, or alcohol. The nits are removed with dilute acetic acid, alcohol, or cologne-water from hairs which it is not desirable to cut. In adults, especially in women, the hair should be spared, while the patient is warned that the loss of the growth upon the scalp may be considerable. Where an obstinate seborrhœa is followed by eczema the latter may be succeeded by alopecia; in the absence of seborrhœa the hairs usually are reproduced. It is rarely necessary to employ the skull-cap in adults, since one can succeed in insuring the necessary applications by directing the attention of the patient to the necessity of care and thoroughness.

As the disease in both classes of patients advances to a subacute

or chronic stage the treatment may be made more stimulating. In the case of infants, however, stimulating topical remedies are very rarely to be employed. An eczema of the scalp that has once entered upon resolution, in an infant or a child, should generally be soothed and protected.

Many children thus affected are in excellent general health, and require no internal medication. The prevailing tendency among the laity and even among many practitioners to dose these little ones with mercury, arsenic, iodides, and other "blood medicines" cannot be condemned too severely. Proper nourishment, elimination, and hygienic surroundings should be sought in every case.

The treatment of erythematous and chronic eczema of the scalp in adults is described under dermatitis seborrhœica.

Eczema of the Face (*Eczema Faciei*).—Erythematous eczema of the face in adults is projected prominently among the varieties of the disease by its uniformity of type. It occurs in early and in middle life and in advanced years, and is a particularly intractable ailment. In well-marked cases the forehead, cheeks, eyelids, and nose of the patient are involved, exhibiting an infiltrated, usually dusky-red, often symmetrical patch of disease, the affected surface being slightly elevated above the level of the sound skin. This surface is uniformly smooth and reddened; occasionally, near the root of the nose and about the lower line of the forehead minute, closely set papules are visible. Very slight oozing, especially after irritation, may be noticed. At the height of the disease, or in its involution, exceedingly fine scales form, which are scarcely perceptibly shed from the surface. The eyelids, especially the lower lids in advanced years, become puffy. The line of demarcation of the attacked surface is unusually distinct, and rarely invades the scalp-border or the region of the beard. Itching is at times intense, the patient bitterly complaining of it and usually preferring to rub the face with the hands or with pieces of cloth. Sometimes, however, the face is well scratched with the finger-nails, and excoriations and blood-crusts disfigure the countenance. Patients of intelligence usually describe the itching as paroxysmal and as starting at the root of the nose, whence it travels upward over the forehead and laterally to the brows, often in the line of the supraorbital nerves. At the root of the nose the exudative process is most marked. The eruption is seen also in asymmetrically disposed patches of various sizes, with islets of sound skin between. In typical cases the hairs of the eyebrow are reduced to a stubble by constant rubbing. In resolution of the symmetrical form this condition of the eyebrows is commonly observed.

Patients thus affected are often those whose faces have especially been exposed to irritation, such as locomotive-engineers, pilots of sea-going vessels, mechanics in trades in which the hands are soiled with irritants and afterward applied to the face, and women spending hours of each day over the laundry-tub or the kitchen-stove. In each class the operation of the cause is made manifest by the exacerbation of the disease after exposure.

Diagnosis.—The affection is most commonly mistaken for erysipelas, a disorder from which it is readily differentiated by the chronicity of its course. The latter feature is particularly characteristic of this form of eczema, which is rarely completely relieved after the age of sixty within a twelve-month, and which, when it has existed for a long period of time, is particularly obstinate under the best treatment, recurring with exasperating frequency upon exposure of the face to atmospheric changes. The great vascularity, abundant supply of sensory nerves, and necessary exposure of the face explain this peculiarity. In its management the lotions and dusting-powders described under the treatment of acute eczema fulfil an important part. In some cases pastes, ointments, plasters, or the glycojelatins give better results than lotions and powders. Soothing applications should always be first employed; and more stimulating applications may be tried later. In many cases Pick's "linimentum exsiccans" or tragacanth-glycerin mucilage furnishes a pleasant and effective application.

In obstinate cases tar and other stimulating remedies recommended for chronic eczema should be employed. It is well to remember in the management of any case that while a tarry application may be well tolerated over one part, as, for example, on the cheeks and near the nose, in another part, as, for example, over the eyelids, a zinc-salve may better be employed in the same individual.

In patients of younger years and especially in infants the face is apt to display vesicular and pustular phases of the disease, forms more often of acute eczema, and correspondingly more manageable.

The itching, and especially the burning sensations, are prone to be severe, and crusts rapidly form. In infants the picture presented is often similar to that seen in the scalp, except that there are no hairs to be matted into crusts and there is often a reddish blush at the edge of the patch or where the crust has been removed, the redness of the oozing surface being somewhat more marked than in the similar patches on the less vascular scalp. The scratching in these little patients is severe, crusts being torn off in part or wholly; blood-crusted excoriations are common. In this way the area of surface involved is clearly extended, sleep is greatly disturbed, and the irritability and fretfulness of the child bear heavily upon its general nutrition. In severe cases of long standing the mental tone of the little sufferers becomes singularly perverted and their character unquestionably changed. The eczema of the cheeks and chin of infants appears at times to stand in close relation to the eruption of the teeth.

This chain of formidable symptoms well linked together will often bid defiance to the most skilled effort to impart ease to the tormented skin. In such cases the harness employed by White, of Boston, fills an important office: a skull-cap, made of firm old cotton or linen cloth, is closely fitted to the calvarium, and a mask of the same material is shaped to the face with exactly placed apertures for the eyes, nose, mouth, and ears. This mask is gathered in beneath the chin, and laps over two inches at the back of the head; it may be used only

during sleep, or, in aggravated cases, also during the hours of wakefulness. A species of straight-jacket is made by passing the head of the child through a hole in the closed end of a small pillow-case, which is then drawn down over the body and arms, and the latter confined at the sides by stitching or pinning the case together between the trunk and the upper extremities. This jacket is finally secured by similar means between the thighs. When it is necessary to imprison the lower extremities they are similarly secured by pins within the pillow-case; and the outer edge of such trousers can be fastened to the bed or the cushion on which the child reclines. This treatment does not preclude the employment of the washes, ointments, etc., which are to be neatly applied next the skin beneath the "trousers" or the "jacket." The ointment or other application is thus retained in position, rest and protection from all external irritation are given to the tormented skin, and its natural tendency to repair soon brightens the case.

Treatment.—For the treatment of these cases are recommended the black-wash and zinc-salve treatment, the diachylon salve, Lassar paste, boric acid ointment, lead lotions, glycerole of starch, and other preparations and methods described in full in the treatment of acute eczema. These cases are often very capricious in their course, and treatment may have to be changed frequently to meet the varying conditions.

Eczema of the Lips (*Eczema Labiorum*).—Reference has already been made to the obstinacy of eczema occurring near the mucous outlets of the body, a result due, probably, to the secretion furnished by the adjacent mucous tracts. The lips furnish an illustration alike of this pertinacity and aggravation. Their frequent motions in mastication and articulation aggravate an eczema, which is, moreover, apt to be teased by a no less frequent thrusting out of the tongue (where there is no beard) to wet the parts with mucus and saliva. Vesicular, pustular, squamous, and erythematous lesions occur at one point, or along the entire line of the lip, with frequently resulting crusts and fissures. The vermilion border of the lips commonly participates in the process. The lips become hot, and sometimes much thickened by the swelling and infiltration, their mucous faces being rarely implicated. Scarlet, dull-red, and other peculiarly purplish hues of the vermilion border become visible. The parts are more picked than scratched, though the itching at times is severe. The pustular and vesicular forms are more common in children. The erythematous form, its reddened outline roughened by scales evenly projected beyond the vermilion border, is rather an affection of maturer years. In many cases the disease is aggravated by nasal discharges which flow over the upper lip, giving the latter an elephantiasic aspect. In eczema of the hairy lip the symptoms and treatment are those of eczema barbæ.

Diagnosis.—The diagnosis is between hyphogenous sycosis, herpes labialis, epithelioma, and syphilis. The first is accompanied by loosening of the hairs, caused by a vegetable parasite; the second

is vesicular in lesion, brief of duration, and trivial in severity; the third is a disease of advanced years rather than of early and middle life, and is accompanied by characteristic induration and ulceration and not by itching. Syphilis is fond of the angles of the lips; in most cases, when thus limited, typical mucous patches of the mouth can be discovered. The lesions of syphilis at the angles of the mouth are seldom linear fissures, but are more often definitely outlined erosions, secreting a puriform mucus. Pustules and resulting crusts of the lips and the nose in female children are often eczematoid features due to the picking and scratching caused by lice upon the scalp.

Treatment.—In male patients the pipe, the cigarette, and the cigar, as well as the tobacco chewed and expectorated, may aggravate the malady. In all cases it is obstinate and calls for either emollient, stimulant, or protective applications. In eczema of the lips displaying acute and painful symptoms frequent fomentations of the part with soft rags dipped in hot mucilaginous and alkaline waters will aid in controlling the swelling and in alleviating the pain. After such bathing some soothing ointment should be applied. In chronic cases, in which stimulation is demanded, this can be effected at the time of dressing, the parts being subsequently protected by collodion or other material. Carbolic acid and silver nitrate are often needed for such dressing.

Equal parts of tincture of benzoin, alcohol, and glycerin applied frequently during the day supply an excellent combination for the vermilion border. For protecting this portion of the lip cold-cream or other simple salve to which has been added enough white wax to make as stiff an ointment as can be spread with the finger, is recommended. A drachm (4.) of the compound tincture of benzoin with 5 to 20 (0.33–1.33) grains of tannin may often be added to such ointment with good results.

Eczema of the Nostrils (*Eczema Narium*) is naturally often associated with a chronic coryza. Inasmuch as one of the common symptoms of hereditary syphilis is "the snuffles," the physician should carefully exclude the possibility of such disorder in every instance when an infant with coryza exhibits an "eczema" of the nares or of the lips. The age of the little patient, an inspection of its anal region (which should never be omitted in infantile eczema), and the history of the case will throw considerable light upon this important question.

Whether occurring in the adolescent or the child, the disease may linger only upon the alæ in the pustular or the squamous form, or may block the nares with crusts. In infants this obstruction enforces respiration with an open mouth, and the grasp of the nipple by the lips is thus interrupted either by respiratory acts or cries of agitation. The Schneiderian membrane participates in the inflammatory process and pours out its secretion upon the eczematous skin. This membrane when inspected is seen to be either raw and succulent, or in a condition analogous to that seen in pharyngitis sicca, that is,

dry, glazed, and free from discharge. The nostrils are often thickened in consequence of infiltration or are fissured, especially at the lines of the nares, laterally and inferiorly. In severe cases, and when the lips participate in this process, the pouting, swollen, and distorted organs suggest the snout of the lower animals. Adults, as a result, frequently suffer from coccogenous sycosis and furunculosis.

Treatment.—In treating these cases all crusts should be removed and the parts carefully be protected. Picking of the nose in children should be prevented, if needful, by the “straight-jacket.” Pencillings with compound tincture of benzoin, iodized phenol, silver nitrate, or collodion often prove serviceable.

In softening crusts oil may be freely used. For this purpose the warm carbolized oil-spray of the atomizer or a glycerin-lotion answers well. After softening and removal of the crusts a simple ointment containing from 5 to 20 grains (0.33–1.33) of boric acid, or from 2 to 10 (0.133–0.66) grains of white precipitate to the ounce (30.) may be used. A weak citrine ointment is often serviceable. When the disease extends well up the nares Neumann employs bougies made by combining 2 grains (0.133) of zinc-oxide with 16 grains (1.06) of cocoa-butter. Hardaway recommends equal parts of cold-cream salve and glycerole of lead subacetate.

Eczema of the Ears (*Eczema Aurium*).—The ears are affected with eczema, both in infancy and maturer years, rather more often in women and children, the disease being limited to the whole or part of the organ, or extending backward over the post-auricular region, or downward over the ramus of the superior maxilla. The eczema may be acute or be chronic, and commonly originates in seborrhœic dermatitis (which see) of the scalp or the face, but may find its origin in chronic or catarrhal discharges from the external auditory meatus; in the growth of aspergillus in the same canal; in exposure to temperature-changes, especially with high winds; in frostbite; in the irritation set up by pediculi and by the auricular rim of the frame of spectacles; in the toxic effect induced by the hook of cheap ear-rings and dyed bonnet ribbons; in the traumatism of ear-piercing; and in the habit of unnecessarily picking the ear to relieve it of wax or of trifling sensations of irritation.

The pustular and moist forms are common at the superior, inferior, and posterior boundaries of the pinna, where a linear fissure is apt to form in the line of the angle made by the auricle with the plane of the adjacent integument. The motions imparted to the ear by handling it, or by placing the hat on the head and tying hat-strings over the ear, always tend to aggravate the disorder. Long hairs worn over the ears have a similar effect by the production of friction and the retention of heat. The lobules may display the erythematous and scaly phases of eczema, becoming infiltrated, and having a deformed appearance and lurid-red color, the affection pursuing an indolent course. The lobules alone of both ears in young women may similarly be affected, and may exhibit these phe-

nomena for consecutive years. Often the chronic inflammation lays the foundation for a keloid growth, an accident of inflammatory processes in other parts.

Sometimes the entire auricles are uniformly dark red, infiltrated, alternately weeping and scaling, and project to a noticeable extent from the side of the head in consequence of their increase in bulk. The itching is usually more annoying than severe, being accompanied by a characteristic sensation of tenseness and fulness of the part. Like the eczema which occurs at the other mucous outlets of the body, the affection in the meatus is particularly obstinate when it assumes a chronic form. Symmetry to the extent of involving both ears, though commonly to a different degree in each, is rather the rule than the exception, and is doubtless due to the simultaneous operation of effective causes.

Diagnosis.—The diagnosis is between erysipelas, seborrhœa (which occasionally occurs in the concha of the auricle), erythema simplex and multiforme, and dermatitis calorica.

Treatment.—The treatment should at first be soothing and protective by zinc-salve or diachylon ointment or by soothing and astringent lotions; afterward stimulation may be needed. A firm bandaging of the ears to the head may be required to support them, to prevent irregular pressure (of the head upon the pillow), and to retain external medicaments. In chronic cases stimulant applications are often well tolerated, and sulphur, salicylic acid, ichthyol, and tar ointments here play an important part. Treatment appropriate to the otitis externa or of the aspergillus may be required. Bulkley recommends an ointment of 1 drachm (4.) of tannin to the ounce (30.), deeply and thoroughly passed into the meatus on a camel's-hair brush. French authors generally advise small tampons smeared with an ointment and left in the canal. Burnett employs 2 drachms (8.) of oil of tar to 1 ounce (30.) of alcohol. Great benefit is derived from painting the indolent surfaces with solutions of silver nitrate. The intractable forms almost invariably affect adults, in whom there is usually a history of improvement under treatment, followed by relapse due to exposure to wind, heat, cold, or other sources of irritation. Many cases require the treatment recommended for dermatitis seborrhœica; others may require radiotherapy.

In Eczema of the Eyelids (*Eczema Palpebrarum*) the free edges of the eyelid, or the skin over the orbital margin of the tarsal cartilage, may chiefly be affected, both in children and adults. When the free edge of the eyelid is involved there is present a species of coccogenous sycoosis, the hair-follicles becoming inflamed and furnishing a purulent discharge which may agglutinate the lids. The latter are thickened and swollen, become the seat of moderate itching, are picked rather than scratched, and exhibit minute crusts between, or glued to the hairs. The disorder is often accompanied by a seborrhœa of the Meibomian follicles, and is described by oculists under the designation of "blepharitis" or "tinea tarsi." Inasmuch as the facial expression

is characteristic when the eyelids are thus involved, patients exhibiting this form of eczema are usually set down as "scrofulous," though the disorder occurs in many individuals with no other sign of struma, and eczema surely is not such a sign.

Fissures occasionally form at the commissure of the eyelids. The disorder may complicate eczema of other parts of the face. In erythematous eczema faciei of adults there is usually swelling with puffiness, especially of the lower eyelid. The conjunctiva may or may not be implicated. A chronic granular condition of the eyelids is not noted as frequently as might be suggested *a priori*.

Diagnosis.—In the diagnosis care must be taken to exclude syphilis, lupus, and pediculi. Piedra of the eyelashes must not be overlooked. Instead of the ordinary nits of the lash, there are in such cases jet-black, pin-head-sized masses of ivory-like hardness attached to the hairs.

Treatment.—The edges of the eyelids should be cleansed carefully with a weak alkaline solution and a soft camel's-hair brush whenever the eyelid is involved, and then as carefully be dried and anointed with cold-cream salve. In acute cases the closed eyelids may be bathed frequently with warm solutions of boric acid or of borax (1 to 2 drachms (4. to 8.) to the pint (480.)), and strips of soft lint, soaked in the same solution, or in a very dilute glycerin and carbolic acid lotion may be laid over the closed lids for as long periods during the day as these remedies are comfortably tolerated. In chronic cases red mercuric oxide ointment, from 1 grain to 10 (0.066–0.66) to the ounce (30.), with or without an equal quantity of salicylic acid, is held in high esteem. Ophthalmologists, in the treatment of this affection, are fond of using an ointment of yellow mercuric oxide, 1 to 3 grains (0.066 to 0.2) to the drachm (4.). In place of these mercurials the unguentum hydrargyri nitratis, 1 part to 6 of cold-cream salve, may be applied, or resorcin 1 part to 100 of simple unguent. Epilation of the eyelashes may be necessary. Pencillings with solutions of silver nitrate in various strengths are also useful in chronic cases, but these solutions must carefully be confined to the eyelids, and not be suffered to come in contact with the conjunctiva. Excessive use of the eyes must be prohibited.

Eczema of the Beard (*Eczema Barbæ*).—Eczema may involve the region of the beard only, or it may exist in connection with the disease on other parts of the face.

In recent cases there is no loss of hair, but in those of long standing the hairs are thinned and fail to hide completely the reddened surface beneath, covered here and there with pustules or displaying floors of broken pustules, dried inflammatory products, yellowish and greenish scales and crusts. Beneath the crusts the surface is smooth, not lumpy as in hyphogenous sycosis. The hair-follicles are not solely involved, as in the coccogenous form of that disease, but evidently they and also the integument between them are inflamed. In chronic cases the symptoms may be those of erythematous and scaling

eczema. In recent eczema the hairs are not loosened in their follicles, but in chronic cases such loosening does occur, and there is a true defluvium capillitii. The disorder is one primarily involving the skin, and secondarily the hair-follicle, extending smoothly over the surface, as smoothly as an eczema on the cheek of a woman. There is commonly a certain degree of symmetry, to the extent at least of involving the beard in different degrees on both cheeks at once, or the chin on both sides; often the symmetry is perfect. Symmetry is rare in the several sycoses of the same part.

The disease is accompanied by itching, rarely so severe as upon the smooth parts of the face, is particularly obstinate, and is extremely disfiguring. When extending into the region of the beard from other parts there is usually association with eczema of the ears. When limited to the region of the moustache there may be an eczema of the nares and a chronic nasal catarrh or seborrhœic dermatitis.

Diagnosis.—The condition is more superficial than that of hyphogenous sycosis. There are no deep-seated nodules as in the latter disease. From coccogenous sycosis eczema of the bearded region is differentiated with greater difficulty, as the two conditions have many features in common. Sycosis is primarily an inflammation of the hair-follicles, a distinct folliculitis, and presents a characteristic pustule pierced by a hair at the mouth of the follicle. In this disease there are also found papules and small tubercles. Though there is a superficial inflammation of the follicle in eczema of the beard, a distinct folliculitis is not present and there are no papules or tubercles. Moreover, the skin-surface between the follicles is evenly involved in eczema, while it frequently escapes wholly or in part in sycosis. Eczema quite commonly coexists on other portions of the face, while sycosis is limited strictly to the region of the beard. It must be remembered, however, that an eczema barbæ is often the forerunner of a genuine coccogenous sycosis.

Treatment.—The treatment of recent cases of eczema of the bearded region is that of similar phases of the disease on other parts of the body, by means of the simpler lotions and ointments, but cases of long standing are exceedingly stubborn and frequently require vigorous measures. After removing crusts and other accumulations by soaking with oil and thorough washing with soap and water the beard must be wholly removed. Clipping short the hairs of the face will not answer, though this is generally preferred by the patient as exposing to a less degree the unsightly surface beneath. Nothing short of epilation or of shaving, and repeated shaving every second day, will effect the desired result in chronic cases. As soon as the disease is reduced practically to an eczema of the non-hairy-parts it improves in proportion to its distance from the mucous outlets of the body. When limited to the bearded cheeks the most obstinate cases in the course of a single month may be robbed of one-half their unsightliness. The patient should be encouraged by reminding him that usually it is but the first step which costs, each succeeding removal

of the beard being accomplished with greater comfort to himself physically and mentally. After each shaving the skin should be bathed with water as hot as tolerable, and, if at night, a lotion or an ointment, or the latter after the former, may be used. The salves most useful for this purpose are sulphur, 10 to 60 grains to the ounce (0.66-4. to 30.); diachylon ointment with salicylic acid, 5 to 10 grains to the ounce (0.33-0.66 to 30.), and zinc or tar ointment. Rarely, the surface requires painting with weak solutions of silver nitrate. As the condition improves a dusting-powder will afford needed protection during the day. The shaving should be continued for months after the disease is at an end.

Eczema of the Genital Organs (*Eczema Genitalium*) is remarkable for the severity of the subjective sensations it occasions; for its tendency to persistence, recrudescence, and nocturnal exacerbation; and for the liability to the production of the sexual orgasm by the act of scratching. In men the surfaces most often involved are the anterior, the posterior, or lateral faces of the scrotum where they meet the thigh, though the surface of the penis, as also that of the pubes and the perineum, may be involved. In women the labia majora, more rarely the labia minora and vestibule of the vagina, are affected, with occasionally extension of the disease to the same contiguous parts as in men.

Eczema thus located is, as a French writer has well said, "a dry disease in a moist locality." Vesicular and pustular forms are much rarer than the erythematous, the papular, the papulo-squamous, and the erythemato-squamous. In women the moister forms are more frequent, doubtless because of the wider mucous outlet and the more extensive mucous tract in the vicinage. The labia are then heightened in color, œdematous, agglutinated by crusts, and often torn viciously by the finger-nails. Blood-crusts excoriations are seen in most of the severe cases. An eczema intertrigo at the labio-femoral angle is common. Over the whole may be poured the normal or pathologically altered secretions from uterus or vagina. The disease, however, is sufficiently common after the menopause, when there is usually physiological atrophy of the uterus.

The typical disease in men is recognized in the thickened, reddened, perhaps slightly scaling integument of the scrotum, which may also be fissured, excoriated by the finger-nails, or covered with blood-crusts. Torn papules, even tubercles and nodose swellings may be closely packed together, exhibiting a lurid or even purplish hue. In aggravated cases the infiltration is so great as to deform the parts, increasing the thickness and deepening the normal furrows of the scrotal integument to the grade of many times its normal dimensions, producing thus an elephantiasic appearance. In eczema of the penis also the prominent symptoms are œdema, itching, and redness with slight sealiness.

In both sexes, as before indicated, attempts on the part of the sufferer to relieve the itching are often as severe and prolonged as they

are ingenious. Commonly no relief is obtained until a serous sweating or weeping of the thickened tissues is induced by the friction. Inasmuch as the latter in severe cases is frequently repeated, the physical dangers are obvious.

Apart from this, however, the disorder has a marked tendency to disturb the mental tone and the general health. Shame deters many from seeking speedy relief, so that cases of long standing are often registered by the physician. Though unconnected with venereal disease of any kind, there is for many a special dread of an eczema of these parts simply because of its location. With sleep disturbed, the mind agitated, and the nervous system teased by an intolerable pruritus, one can scarcely wonder at the eloquence with which many patients describe their sufferings. It is a disease of middle life and of advanced years. It is rare to see a well-marked, obstinate case in a child.

The causes, exciting and aggravating, of eczema of the genital region are often obscure, but undoubtedly depend largely upon heat, moisture, and friction. These factors are favored—first, by the effect of gravity, the organs in question being situated, when the body is in the erect position, at the inferior apex of the double cone forming the trunk and being thus subject to the force of gravity; second, by the arrangement of the clothing in both sexes, by which heat and friction-effects are heightened; third, by uncleanness, the secretions and discharges from the adjacent mucous tracts being suffered to accumulate upon the person. The cause may lie in some disturbance of the genital organs or of the general nervous system.

In many eczemas of the surface, and especially those of the genital region, the urine will be found to contain albumin or sugar, and these conditions have been supposed to lie at the root of the eczema. Aside from the fact that the presence of these substances in the urine points usually to constitutional abnormalities which in themselves might predispose the skin to eczematous attacks, it may be said of sugar that it is, *per se*, a profound irritant to the skin and mucous membranes. Any part moistened constantly or intermittently with saccharine urine will respond eventually with an outburst of eczema. Sugar and albumin are known, however, to be producible in urine by external irritants, among which are cutaneous diseases. If a patient with saccharine urine and severe genital eczema be kept in bed in the recumbent position for a few days, while any soothing application productive of comfort is continuously applied to the tender and excoriated surface, the sugar may rapidly disappear from the urine. Many cases of extensive and severe eczema of the genital region in both sexes occur in patients in whom careful and repeated examination of the urine fails to reveal sugar, but the practitioner is urged never to omit such examination in his treatment of a typical case. Genital eczema occurring with glycosuria is one of a group of disorders named by French authors *DIABÉTIDES GÉNITALES*.

Diagnosis.—The diagnosis of eczema of the genital organs is be-

tween ringworm, acne, pruritus, scabies, pediculosis, the venereal disorders, and herpes progenitalis. The first-named affection may occur alone or may induce or may be grafted upon the eczema. Ringworm may be recognized by the discovery of the trichophyton, and is clinically distinguished by the crescentic edge of the spreading patch, its convex border looking away from the genital centre. The "follicular vulvitis" of gynæcological authors is a genital acne and is manifestly limited to the glands and the peri-glandular tissues. The same is true of bromine and iodine acne, which may be developed in the same situation in both sexes. Genital pruritus may beget an eczema from scratching, but it is accompanied primarily by no skin-lesion. The pruritic papular lesions of scabies upon the male genitalia are always associated with typical manifestations elsewhere on the body. The pubic louse is visible to the eye, as are also its reddish excreta and nits. The ulcers and sclerosis of chancroid and primary syphilis are rarely accompanied by pruritus, and, though occasionally multiple, never exhibit diffuse patches of disease. Syphilodermata are recognizable by their characteristic features and the history of an infectious disease. In herpes progenitalis there are precedent burning, smarting, or neuralgic sensations, the occurrence of vesicles or groups of vesicles (lesions rare in eczema of the genitals), and frequent limitation of the disorder to the mucous surfaces or to the muco-cutaneous lip by which such surfaces are bounded. In eczema these boundaries are usually respected and the disease is much more strictly cutaneous.

Treatment.—The treatment is to be conducted on the general principles heretofore outlined. Careful attention should be directed to the diet and the habits of living. In diabetic cases every effort should be made to remove or reduce the sugar present in the urine by an appropriate regimen. Sponging of the genital region with alkaline water as hot as can well be tolerated, followed by the blander lotions, oils, and ointments at night, and the use of antipruritic dusting-powders in the daytime, must not be omitted. One per cent. solutions of formalin are of value. In eczema of the scrotum a suspensory bandage lined with lint which is wet with a lotion, smeared with an ointment, or thoroughly covered with a powder, can usually be employed with advantage. The habit of scratching must be broken up at all hazards. In chronic cases treatment by soft soap and diachylon ointment will be found useful. Caustics, solutions of mercuric chloride and other mercurials, carbolic acid, and especially the tarry compounds, are often necessary. The Lassar paste also may be used with advantage. In some persistent cases with decided infiltration, radiotherapy has given prompt relief.

The following formulæ are useful in allaying the irritation of some acute and subacute cases:

R	Liniment. calcis,	fʒiv;	120	
	Zinci oxid.,	ʒij;	8	
	Glycerini,	fʒij;	8	
	Liq. calcis,	fʒiv;	120	M.

Sig. Lotion to be applied at night after bathing the parts with hot water.

R	Liniment. calcis,	f3iv;	120	
	Acid. hydrocyanic. dil.,	f3j;	4	
	Liq. plumbi subacetat.,	f3ij;	8	
	Glycerini,	f3ij;	8	
	Aq. ros.,	ad f3viiij;	240	M.
Sig.	Cream, for application on strips of old linen.			

Exceedingly obstinate eczema of the pubic region is benefited by shaving and subsequent appropriate treatment. When complicated by intertrigo the latter condition requires special relief by the interposition of soft lint spread with an ointment.

Eczema of the Anus and Anal Region (*Eczema Ani*) in its etiology and characteristics, is closely allied to the same disease in the genital region. The presence of ascarides and hemorrhoids occasionally induces or aggravates the disorder; though this complication is rarer than is commonly supposed. Multitudes of men and women who suffer from piles never complain of eczema. The eczema may occur in erythematous, squamous, or papular form, in the order named; thus exhibiting here, as on the genitals, "a dry disease in a moist locality."

The redness, infiltration, and itching may be limited to the verge of the anus, radiate from the latter in stellate lines, creep upward between the nates in the cleft, sweep forward over the perineum to the genital region, or extend laterally with intermediate intertrigo over the inner face of each thigh. Rarely the buttocks are covered with the same lesions. Fissures and excoriations are apt to appear about the anal orifice.

This disease is common in infancy, when want of attention to the removal of the napkin is a fertile source of mischief; and also, in persons in middle life and in advanced years, when it becomes particularly intractable. The itching is intense in the latter class, with frequent nocturnal exacerbation. Unfortunately the scratching is often reflex, and is practised during sleep, from which the patient is often aroused by his or her manipulations. Pollutions fully recognized, or occurring during profound sleep, or, more usually, in states of semi-consciousness, complicate certain cases; defecation becomes painful; the harassed nervous system of the sufferer is often in a deplorably wretched condition. In cases of long standing the usual congested, thickened, infiltrated, and almost elephantiasic appearance of the skin is presented, with occasional fissures and exaggeration of the natural furrows. The part may simulate in aspect the formidable conditions discovered in passive pederasty.

Treatment.—In the treatment of these cases the use of very hot water by sponging, and the subsequent application of ointments, in some cases mild but in others stimulating, have yielded the best results. In the case of infants dusting-powders and the blander ointments are alone to be employed; in adults, especially in chronic cases, tar in some form is especially valuable. Here the Lassar paste may be applied or tincture of tar be freely painted over the surface, or there may be used one of the tarry ointments, such as the Wilkinson salve,

of sufficient firmness to retain its form as an unguent when subjected to the heat of the part. Caustics, especially the silver nitrate in crayon, are useful when there are fissures and excoriations. Corrosive sublimate, $\frac{1}{4}$ to $\frac{1}{2}$ of a grain (0.016–0.033) to 4 ounces (120.) of milk of almonds; Squire's glycerole of plumbic subacetate, $\frac{1}{2}$ drachm (2.) in 2 ounces (60.) of glycerin and water, or as a substitute for the latter, soft soap and diachylon plaster, are here of special service. Almond-oil, or an ointment containing 2 to 10 per cent. of carbolic acid, often gives relief. Duhring recommends the following:

R	Sulphur. præcipitat.,	℞ ij;	2 66
	Naphtol.,	℞ j;	1 33
	Morph. acet.,	gr. ij;	133
	Zinci carb.,	℥ j;	4
	Ungt. aq. ros.,	℥ j;	30 M.

When defecation is painful the stools should be semiliquid in order to insure non-aggravation of the local disorder, not, it need scarcely be remarked, with a view to eliminating any *materies morbi* by purgation. Small tampons of cotton may be smeared with an emollient ointment and gently be inserted for a short distance within the anus. Tincture of benzoin, 1 part to 8 of vaselin, may be used for this purpose. Kaposi recommends cocoa-butter suppositories, containing zinc oxide with belladonna or opium. When complicated by true fissure of the anus the sphincter ani must be stretched or divided, or dilated with medicated bougies. At night a cataplasm is applied. The parts are washed frequently with tepid water, and the anal tampons are smeared with cocaine. During the day zinc-oxide salve, 30 grains (2.) to the ounce (30.) of vaselin, is applied, and over this are thoroughly sprinkled equal parts of zinc-oxide and bismuth-sub-nitrate in fine powder. Collodion medicated with 1 to 3 per cent. of salicylic acid, and lotions containing 1 scruple (1.33) of silver nitrate to the ounce (30.), are of great value in many cases. Besnier recommends the use of a clyster after each bowel-movement, the fluid being retained for only a short time.

Veiel prefers the cautious use of chrysarobin to tar, employing the latter either in the form of spirits or as tar-diachylon, 1 part to 20, gradually increasing in strength. Carbolic acid, 1 to 5 per cent., and glycerin, 2 to 10 per cent., in elder-flower water or in almond-emulsion, are specially indicated in fleshy women when the disorder, as is often the case, is complicated with intertrigo.

The key to most cases of anal eczema is to be sought in the dietary. This disorder, in adults particularly, is likely to be a significant symptom of gout, and without the dietetic and medicinal treatment of that condition no local applications avail. Tobacco and alcohol are invariably to be excluded in the case of patients of this class; and blue pill, alkalies, colchicum, and salicylates are often needed. It is in these manifestations of eczema that health-resorts furnish their best results, necessitating and inviting, as they often do, an out-door life,

an appropriate regimen, and an avoidance of stimulants. Even in children and infants, when there are no ascarides in the rectum or the vulva, the dietetic management of the patient should never be neglected.

Eczema of the Nipple and Breast of Women (*Eczema Mammaræ*).—Eczema of the mammary region is common in nursing-women, either from the irritation produced by the mouth of the infant, or, more commonly, in consequence of a galactorrhœa. Eczema intertrigo is common below and between the breasts. The eczema here is vesicular, erythematous, or squamous in type, with fissures at the apex, the side, or the base of the nipple. The serous ooze from the infiltrated areas dries as usual into light-colored crusts. There are the characteristic burning and itching. The disease may occur on one or both breasts, and, especially with a galactorrhœa in the summer, may spread extensively, covering both breasts, the surface of the belly, and the intermammary region. The circumscribed forms occur also in pregnant or in unmarried women, and are to be distinguished from scabies, which in women is prone to occur upon the breast.

Page's Disease, which in its early stages presents all the appearances of an eczema, is more fully described in this treatise among the epitheliomata; it is sufficient here to call attention to the important fact that a fairly well-defined eczematoid patch, surrounding the areola of the nipple or that organ only, with infiltration, itching, and possibly a fissure of the nipple, or a crust covering a superficial erosion, may be the sign of an epitheliomatous change already advanced either in the affected part only or deeper in the galactiferous ducts of the breast itself.

Treatment.—The treatment of mammary eczema is that of eczema in general. In severe cases with galactorrhœa nothing short of weaning the child and a cessation of all demands upon the breast will insure relief. Every effort should be made in milder cases to avoid this *dernier ressort*. The nipple should be thoroughly cleansed after each nursing. As a rule, hot water and soap may be used for the purpose without harm and usually with benefit. Any fissures existing should be then painted with compound tincture of benzoin, tincture of myrrh containing 1 grain of mercuric chloride to each ounce (0.06 to 30.) or weak solutions (2–15 per cent.) of silver nitrate. The whole should immediately be covered with a protective ointment or paste. The zinc oxide or diachylon ointment spread on lint serves the purpose well. Salicylated and borated pastes are sometimes preferable. Lister's salve often does well:

℞	Acid. boracæ. subtil. pulv., }	āā gr. xv;	āā 1
	Ceræ alb., }		
	Paraffin., }	āā 3ss;	āā 2
	Ol. amygdal., }		M.

In some instances stronger and more stimulating remedies are

necessary. Before the child takes the breast all but the simplest preparations should be entirely removed with oil or other unirritating agent.

Fournier recommends a breast-plate of caoutchouc. When the disease is limited to the nipple and areola in nursing-women the glass- and rubber-apparatus sold in the shops may be tried in the hope of saving the nipple from mouth-contacts in nursing. Sometimes they answer admirably; often they utterly fail. Dusting-powders are valuable in mild cases, and for any intertrigo that may exist between and beneath the breasts.

Eczema of the Umbilicus (*Eczema Umbilici*) is briefly described in the chapter devoted to Seborrhœa. In most cases it is either induced or is aggravated by a seborrhœa fluida which gives origin to the peculiarly nauseating odor characteristic of the disease. Generally a reddish and infiltrated, more or less annular patch surrounds the umbilical depression, which may be filled with crusts. Syphilodermata, pediculosis, and scabies in women are to be carefully excluded in the diagnosis.

Treatment.—Liquor sodæ chlorinatæ, carbolic acid solutions, and, in chronic cases, iodized phenol will be required in its management. The dressing of the navel in the newborn infant, the improperly adjusted apparatus for retention of an umbilical hernia, and the corsets or “uterine supporters” of women, should not be permitted to occasion or aggravate the disease.

Eczema Crurum (*Eczema Crurale*).—Upon the legs, where the force of gravity is more potent than in other parts of the body, aggravated forms of eczema are found complicated with varicose veins and œdema, with dense infiltrations and indurations. In ancient cases the frequent elephantiasic aspect is significant, one limb being several inches larger in circumference than its fellow. The skin is covered from knee to ankle with enormous patches of eczema rubrum of an intensely angry appearance, moist and crust-covered; or is dry, glazed, and of a lurid, reddish hue; or is dry, horny, and ridged with irregular projections surmounted by scales resembling the rough bark of a tree; or, again, with or without œdema, the integument is tense, inelastic, seamed with scars of old varicose ulcers, and deeply and irregularly pigmented, a condition with some difficulty distinguished from syphilitic ulceration of the same region. At its onset eczema of these parts may assume any one of its known forms. In infants in long clothing, where the lower extremities are subjected to a higher temperature than in adults, the vesicular and pustular forms are common. The exceedingly obstinate forms of eczema of the legs, especially those complicated with varicose veins, are, of course, chiefly encountered in middle life and in advanced years.

Diagnosis.—The diagnosis is, in general, to be established by considering the points heretofore discussed. The chief difficulty lies in distinguishing the eczema associated with ancient varicose cicatrices of the leg from syphilitic scars of the same locality that have resulted

from degenerating tubercular syphilodermata or from gummata. In some cases, when no distinct history can be obtained, there will be a doubt, since the force of gravity upon the vessels, even without varicosities, produces certain common features, notably deep pigmentation, in both classes of cases. In women the sexual history is all-important, including the order of succession of abortions, miscarriages, and viable infants. In both sexes the discovery of other lesions, and especially of characteristic cicatrices elsewhere, must be attempted.

FIG. 45.



Eczema of the legs.

It will be remembered that the syphilitic ulcer tends to the shape of a circle or a segment of a circle, and though occasionally existing as the sole lesion upon one leg, it is frequently multiple, or may involve both extremities, the pigmentation in old cases occurring chiefly at the periphery of the scar. Very extensive pigmentation about ancient cicatrices, especially disposed between irregularly defined scars, is commoner in eczematous forms, as the pigmentation due to syphilis though long-lived is yet the more ephemeral. With periosteal nodes the diagnosis is clear.

Treatment.—The treatment of eczema of the legs does not differ from that of eczema in general, except as regards the indications to be met relative to the support of the parts, thus counteracting the effect of gravity. In severe cases rest with the foot elevated and the leg placed in the horizontal position should be maintained, and other indications met by the use of the various liniments, lotions, and ointments already described. For those who must pursue their accustomed occupations the problem is difficult. An excellent preparation

for subacute and chronic cases is found in the glycogelatins (*q. v.*), as they furnish not only protection, but also some support. Moreover, they frequently may be left in position for a week at a time. As a rule, they are not indicated in acute cases or where there is much discharge; yet in some of these cases they are well tolerated and do good. From 1 to 3 per cent. of ichthyol, thiol, or salicylic acid in most cases may be added to the glycogelatin with advantage.

A dressing well adapted to the larger number of cases of eczema of the lower limbs is disinfection of the surface and the application of the Lassar paste or other well-selected unguent or paste, followed by dusting the whole area with a powder, over which may be neatly applied, if desirable, a cheese-cloth bandage. Often, however, this bandage may be dispensed with, as in both sexes a woman's long stocking, made light and thin, such as is used in the summer season and always of white or undyed cotton, may be drawn over the limb. Over this stocking may be wound, for the purpose of support, either a flannel bandage cut on the bias, which can, as a rule, be applied without especial skill by the inexpert, or in chronic cases that will tolerate it an elastic bandage, the inner white stocking being changed with each dressing. In the case of male patients it is often desirable that the man's "sock" be drawn over the long white stocking below. In this way support without compression (which is the essential point) may be secured.

A favorite dressing in dry, papular, erythematous, and squamous patches of the disease is applied as follows: the parts are bathed with hot borated water for several minutes until the itching is relieved, and then are carefully and thoroughly dried. The patch is then completely covered with a dusting-powder, which, according to the indications of the case, is either emollient, astringent, or stimulating. Finely powdered tannin with French chalk, or boric acid and starch, or bismuth subnitrate, zinc, and starch may thus be used. Strips of cheese-cloth are superimposed. A snug-fitting rubber or flannel bandage cut on the bias encompasses the whole. The dressing is left *in situ* as long as it is comfortable, often for two or three days, when it can be removed. In properly selected cases the itching is relieved, the infiltration is reduced, and the patch soon loses its hyperæmic aspect. Occasionally no other treatment will be required.

Eczema of the Hands and the Feet (*Eczema Manuum, Eczema Pedum*).—No more striking illustration of the significance of the etiology of eczema can be adduced than that to be discovered in the hands. With these organs man toils to earn his bread, and the eczema they display is their protest against the rude contacts which are thus necessitated. Unfortunately, in too many patients the imperative necessity of bread-winning forbids consent to the best methods of relief, viz., temporary disuse of these organs. The feet may be similarly attacked, and for similar reasons. A broken down transverse arch of the foot is cited by Ruggles as a cause of eczema in this region.¹ All forms of eczema are here seen—erythematous, vesicu-

¹ J. C. D., 1909, xxvii., pp. 105-111.

lar, papular, pustular, and squamous—involving the entire surface, or limited to the wrists, ankles, interdigital spaces, palmar or plantar surfaces, or one or more digits of either hand or foot. The motions of the part are so free that fissures are common and often are exceedingly painful. The itching may be severe, and parts of one hand or of one foot may be extensively rubbed, torn, or abraded by the other. Vesicles are frequently encountered upon delicate portions of the skin, as over the dorsum and interdigital spaces, while in the denser palm and sole such lesions are deep seated and do not tend to spontaneous rupture, but on puncture a clear serous or a cloudy fluid may be evacuated.

FIG. 46.



Eczema fissum (Fox).

Palmar and Plantar Eczema is commonly asymmetrical, but may be symmetrical. The hands are more often involved than the feet. The condition is characterized by the appearance of irregular, ill-defined, more or less diffuse areas of dry, dead-whitish, or hyperæmic, indurated, and thickened integument, which may be fissured or which may produce such a tense inelasticity of the surface that the digits are semiflexed into the palm or sole.

Circumscribed patches of eczema, with fairly defined outline, reddish in color beneath crust or scale, subacute in course, and accompanied by paroxysmal itching, are of common occurrence on the dorsum and also on the palm or the sole. In the latter situation they may be traversed by one or more painful fissures, the same being true of the fingers and the toes. Upon the back of the hand these circumscribed patches are prone to pursue an indolent course, improving temporarily under appropriate treatment and becoming aggravated by every exposure to the causes by which they were first induced.

The long list of etiological factors which may here be efficient can scarcely be enumerated. The majority have already been considered in discussing the causes of eczema in general. The influence of all articles handled in the trades, occupations, and professions, as well

as the action of toxicants and dyes, must be remembered. Thus, printers, bakers, and masons suffer in the hands, and the wearers of dyed stockings and coarse, ill-fitting shoes and boots suffer in the feet. These so-called "*Trade Eczemas*" are often due wholly to local causes and disappear promptly on removal of the latter. Such conditions should properly be classed under chronic dermatitis.

Diagnosis.—In the matter of diagnosis, scabies, dysidrosis, psoriasis, and syphilis have to be considered. In scabies the vesicles are firmer, more often unruptured, are fewer, are more isolated and more intermingled with crusts, pustules, and even with bullæ, which latter are rare in eczema. The discovery of the parasite or its burrows and a history of contagion will aid in removing doubt. Numerous pustular lesions in young subjects are, however, most commonly produced by the acarus. The occurrence of the eruption on the body elsewhere than on the hand is also to be expected in scabies, with respect to which it should be remembered that the burrow may not be visible, and that it may be wanting when the parasites are present. In dysidrosis there is usually a history of hyperidrosis of the hands and feet. The lesions, which are vesicular at first, becoming pustular later, are usually larger, more deeply seated, and less numerous than in eczema; they appear in greatest number upon the digits, in many instances not involving the palms or soles; are less inflammatory and produce a sensation of burning rather than itching. Exfoliation in dysidrosis leaves a tender epidermis rather than an infiltrated, oozing surface. Psoriasis of the palms and soles is almost always accompanied by the presence in other parts of the body of patches, the typical characters of which should throw light on the local disorder. They are dry, non-discharging lesions, very rarely fissured as in eczema of the hands, have a distinct contour (which is rare in eczema), and are covered with more abundant and more lustrous scales. Eczema is less sharply outlined, and occurs in larger and more diffused areas than either psoriasis or syphilis. The scaling syphilodermata of the palms and soles occur early and late in the disease, and usually after a distinct history of infection. The lesions in syphilis are usually isolated, firm, deep infiltrations, circular in outline, with very sharp definition, and they may be covered with dry, adherent, dirty-white scales, beneath which the brown-and-red hue of the persistent lesion can be discovered. Superficial or deep circular excavations of tissue, single or multiple, with punched or ragged edges, are visible. The eruption is rarely, like eczema, accompanied by itching or by discharge, but painful fissures may form. It occasionally affects the dorsum of the hand or the foot, favorite sites of eczema manuum, but almost invariably it has in such cases swept thither from the palm or from the sole.

In both syphilis and eczema of the hand the right organ in right-handed toilers is usually most involved, even where there is apparent symmetry of distribution of lesions.

Treatment.—The treatment demands, first, rest for the organs and

a simultaneous discontinuance of the exciting cause. In the trades the result of the latter can usually be demonstrated by the patient, who notices the difference between the condition of the skin on Monday morning after a Sunday's rest and that which was distressing on the preceding Saturday night. When practicable, protection during labor must be secured by the use of gloves, neatly applied finger-cots, rubber-stalls, or bandages, retaining a dressing to the part of the hand or the foot that is the seat of the disease. For circumscribed, non-discharging patches on the dorsum of the hand or the foot the dressing described in connection with eczema of the extremities may be applied. When the nature of the labor performed is such as to render it impossible to secure protection of the hands or fingers in this way, something may be accomplished in a few cases by directing that the hand be frequently dipped in a protective solution or powdered during the hours of labor. Thus, printers may dust their fingers with lycopodium, and individuals compelled to retain their hands in irritating solutions can anoint these organs occasionally with an oily or fatty substance. Generally it may be said that eczematous hands are too frequently brought in contact with water; the ill effects of this are made evident not only in laundresses, but also in those who personally must attend to the ordinary duties of the household. For cleansing the hands oatmeal water may be used and after each washing they should immediately be covered with a suitable dressing, or with a simple lotion, ointment, or powder. For protection of the hands and for the retention of dressings the cheap white cotton gloves such as are worn by infantrymen are convenient and serviceable. They should be large enough to go on over the dressings easily and should be washed as soon as soiled. For mild cases equal parts of tincture of benzoin, glycerin, and alcohol diluted more or less with water make a serviceable and agreeable application. When extensively and acutely involved the hand should be dressed with care, each finger being separately wrapped in gauze which has been soaked in a lotion or oil or has been spread with the selected ointment or paste, and the whole covered with a bandage or other dressing.

The local application must be chosen in accordance with the principles previously given for the treatment of eczema in general. In subacute and chronic types tarry compounds are very useful, and caustics more than ever needful when there are fissures. The fissures may often with advantage be painted with compound tincture of benzoin. Protective flexile collodion plays an admirable part about the finger-nails where irritable seams and fissures form with overhanging fringes of torn and ragged epidermis, bordered with red. In painful eczemas of this region the immersion, particularly at night, of the entire hand or the foot in hot borated water may be practised, followed by careful drying and dressing with the selected application.

When the epidermis of the palm is greatly thickened it should be shampooed at night with green soap, pure or in spirit, with the aid

of hot water, followed by a salicylated soap-plaster or by a salve containing white precipitate, 10 to 20 grains to the ounce (0.66–1.33 to 30.), or some preparation of tar. For intractable cases caustic potash, in the strength of 20 to 30 per cent. solutions, can be mopped well into the thickened palm and be followed by a salve application. Crocker suggests the application of dressings moistened with a solution of pancreatin or papain to the areas of thickened epidermis, the purpose being to soften the cells by digestion.

A paste useful in many mild cases and one which dries rapidly is made of 10 parts each of glycerin, dextrin, and water. To this may be added from 1 to 3 per cent. of thiol or ichthyol. The ingredients are mixed on a hot water-bath and form a sort of liniment, which may be painted on the skin. Unna's litharge-glycerin-starch paste, described on a preceding page, is also a valuable and effective preparation for subacute cases. For chronic, sluggish eczema of the palm Duhring recommends an ointment composed of equal parts of mercurous nitrate, plumbic acetate, and zinc oxide ointments.

Radiotherapy has given excellent results in a number of these cases, the technique being that employed in the treatment of psoriasis.

For the fingers and hands Unna's mull-plasters, but only if freshly imported, fill every requirement. These plasters may be cut into strips and be applied with neatness to every digit. Zinc-oxide, salicylic acid, tar, and ichthyol mulls are all available for this purpose.

The condition known as *chapping* of the hands and face is, properly speaking, a dermatitis, since it is usually dependent upon exposure to wind and weather and disappears when the cause is removed. It sometimes occurs, however, as a condition indistinguishable clinically from mild eczema of this region. In those subject to this disorder care should be taken through the changeable weather of spring and autumn not to expose the skin to cold or wind, especially if the hands have been previously immersed in water and are not perfectly dry. In many instances the mischief can be prevented by a simple oiling of the skin after each washing, or instead of oil equal parts of tincture of benzoin, glycerin, and alcohol may be used. This last preparation is not only a preventive, but it often affords relief in mild cases. Severer forms should be treated as corresponding grades of dermatitis or of eczema.

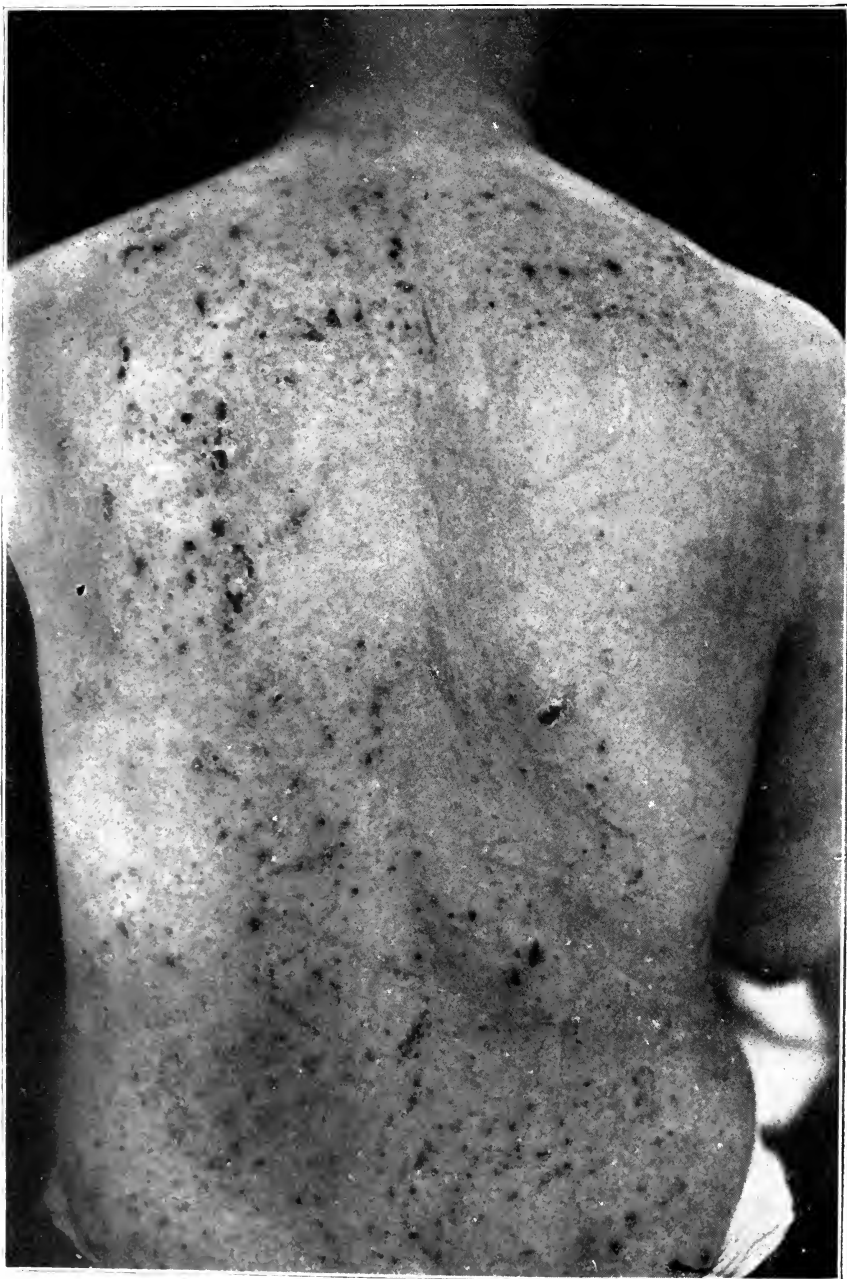
Eczema as it Affects the Nails (*Eczema Unguium*).—For description of this affection see the section devoted to diseases of the nails.

Eczema of the Tropics (Prickly Heat). (*Eczema Solare, Lichen Tropicus, Miliaria Rubra, etc.*)—For description of this disorder see the chapter devoted to tropical diseases.

Universal Eczema.—Patients thus affected should be treated in bed. The diet, which is of great importance, should be of unstimulating quality; but it is not to be forgotten that in a disease involving the entire surface of the body the strength is sooner or later liable to be exhausted, and a supporting dietary, even ferruginous tonics, is often required.



• PLATE III



Traumatic Dermatitis Consecutive to Pruritus Cutaneus.

The local treatment is by alkaline and bran-baths, followed by lime-water-and-oil lotions, a dusting powder, ointment, or other dressing suited to the local condition. In treating universal eczema the entire surface does not usually require the same topical agents. Often there should be cold-cream salve, freshly made, for the eyelids; a dusting-powder for the non-discharging or scaling surface; a salve or an oiled lotion for discharging surfaces of the integument; and special dressings for the extremities, the ears, the hands, etc.

DERMATITIS.

(*Ger.*, HAUTENTZUNDUNG; *Fr.*, DERMATITE, DERMITE.)

Inflammation of the skin occurs in a large number of cutaneous affections. Under dermatitis, however, are grouped those inflammations only in which the result is plainly due to a direct influence exerted upon the skin by thermal, chemical, or mechanical agencies. The inflammatory process may involve the superficial or the deep portion of the integument, or it may extend to the subcutaneous tissues, and even deeper. The symptoms vary with the nature of the cause, the extent and degree of its influence, and the circumstances attending its operation. There may be simple hyperæmia and œdema of a few hours' duration, or there may follow papules, vesicles, bullæ, pustules, and crusts. These lesions may be situated on an intensely reddened and much swollen base. In severe cases ulceration, gangrene, and extensive scarring may occur. With these phenomena there may be general symptoms of mild or of severe grade, due to the influence exerted by the local process upon the general economy. When the exciting cause is of moderate intensity but is long continued there results a chronic dermatitis in which the skin may be more or less thickened and infiltrated, dull red in color, and covered with fine adherent scales.

DERMATITIS TRAUMATICA.

External violence, varying in character and severity, is capable of inducing dermatitis, the symptoms of which differ in degree, though their career is, in general, the same. In this list are included the inflammations produced by surgical interference with the continuity of the integument; excoriations caused by scratching, by friction with garments and other articles injuriously acting upon the skin; by the various implements handled in the trades; and by the bites or the stings of beasts, insects, reptiles, and fishes, when the result is traumatic and not toxic in character. These injuries may be in the form of contusion, blow, concussion, pressure, puncture, incision, or laceration, and the consequences be declared in heat,

swelling, redness, and pain; in itching, burning, stinging, or pricking sensations; with subsequent inflammatory symptoms varying in grade from mild and transitory hyperæmia and exudation to the severer grades of inflammation mentioned in the preceding paragraph.

DERMATITIS VENENATA.

Certain medicinal and other substances applied to the external surface of the skin are capable of exciting inflammation by operating either as caustic, irritant, toxic, or even traumatic agents.

Symptoms.—Careful observation of a typical case of dermatitis venenata soon after the onset of symptoms will disclose the exact surface of contact, such surface being distinctly outlined by a reddened, tolerably well-defined line, within the limitation of which will be seen a slightly tumefied, erythematous area, at times displaying

FIG. 47.



Dermatitis venenata (Fox).

closely packed, pin-point-sized papules, vesicles, or pustules. As the dermatitis progresses it is not necessarily limited to the surface with which the irritant has come in contact. The inflammation may extend to adjacent portions of the skin, or, as a result of absorption and consequent toxic effects or of reflex nervous irritation, it may appear on distant surfaces of the body. Numerous types of cutaneous lesions—macules, pustules, papules, vesicles, bullæ, wheals, scales, crusts, free serous and purulent discharges, subcutaneous abscesses, and even gangrene with sloughing—may occur, the result being largely proportioned to the character of the agent producing the injury and to the susceptibility of the individual.

Erythema limited to the region covered by the diaper in infants may occur in epidemic form in hospitals or in isolated cases in private families. It is caused by the use of borax and soft-soap in washing linen. Sheets and pillow cases may produce the same rash on other parts of the body.

Etiology.—Among the sources of dermatitis venenata may be named most of the strong acids and alkalis, croton-oil, cantharides, mustard, tartar emetic, mezereon, the salts of mercury, arnica, turpentine, ether, chloroform, tarry compounds, resorcin; many of

the dyes, several members of the rhus family (*Rhus toxicodendron*, poison-ivy, and *Rhus venenata*, poison-sumach), the nettle, the smartweed (*Polygonum punctatum*), cowhage (*Mucuna pruriens*), and glass in fine powder or in delicate filaments, such as are thrust into the skin when handling certain articles of Venetian glassware. This list might indefinitely be extended, as there are few articles which are not capable of producing some irritation of the surface of the skin if applied to it with sufficient vigor and for a certain period of time; and in some cases it is difficult to decide whether the effect is more traumatic than toxic. An almost equally long list of substances of animal origin might be named having poisonous effects upon the

FIG. 48.



Dermatitis venenata.

integument, such as decomposed or ammoniacal urine, feces, ichorous pus, and pathologically altered secretions from the uterus, the eye, ear, nose, etc.

A few of the more common causes of dermatitis are: the use of soap containing an excess of alkali or even minute particles of bone for laundry, toilet, or other domestic purposes, as also several of the proprietary articles sold in the shops for similar employment. Stockings and other undergarments dyed with anilin, picric acid, chromium, or arsenic; hair dyes, the leather lining of the inside of the hat or the cap, and the painted toys to which the lips of children are applied, will beget mischief in the various regions of contact for each. Duhring reports cases in which the dyestuff in the lining of shoes penetrated the material of stockings in women, and produced dermatitis of the feet or the legs.

The tincture of arnica, an article much used as a domestic application for contused and incised wounds of a simple character, has produced very serious annoyance in some cases, two such having been recently presented at the author's clinic. The number of these accidents is annually increasing. Cartier¹ reports excessive erysipela-

¹ Lyon méd., April 13, 1884.

tous swelling, a phlyctenular eruption, and submaxillary adenopathy resulting from the external use of arnica. Beauvais reported to the Paris Medical Society gangrenous results in one case. Buchner believes this poisonous action to be due to insects (particularly the *Atherix maculatus*) found in the calyx of the arnica-flower. Other native plants, a large number of which are enumerated in a valuable monograph and supplemental list by J. C. White,¹ are similarly

FIG. 49.



Dermatitis venenata produced by chemicals.

effective. Wesener,² reports that the Malacca bean-tree (*Anacardium orientale*) furnishes a caustic oil, called "cardol," or "cardo-leum pruriens," that produces, after application to the skin, vesicles and vesico-pustules which contain cardol and terminate by crusting. He reports a generalized eruption, beginning on the face, due to this cause.

The antiseptic dressings of modern surgery are at times responsible for eruptive disorders. Among these antiseptics may be named iodoform, which has produced erythema, vesicles, pustules, and wheals.³ Carbolic-acid and corrosive-sublimate dressings have had similar effects. The prolonged application of weak solutions of

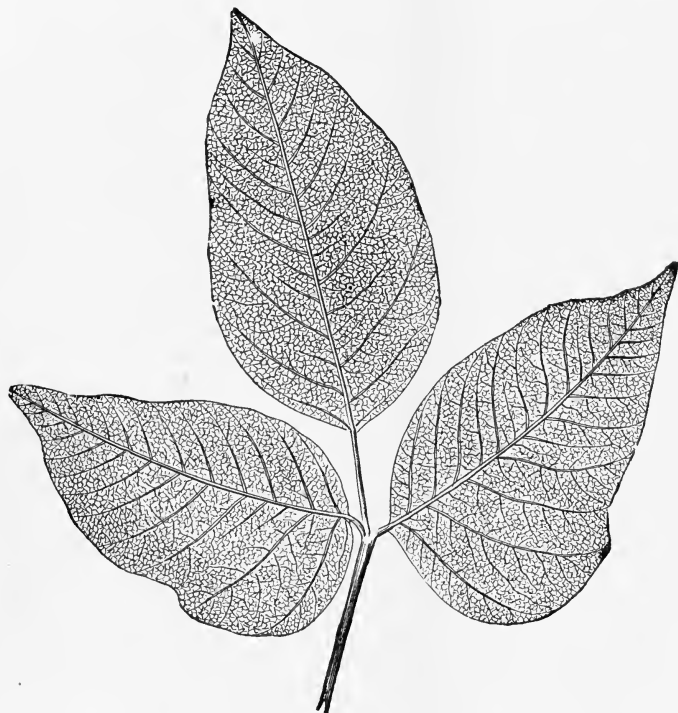
¹ *Dermatitis Venenata*, Boston, 1887; and J. C. D., 1903, xxi., p. 441.

² *Deutsche Arch. f. klin. Med.*, xxxvi., p. 578.

³ See paper of K. W. Taylor, read before the New York Academy of Medicine, 1887.

carbolic acid is followed occasionally by gangrene.¹ Formalin causes vesicular and pustular lesions of the fingers in predisposed individuals. Orthoform may give rise to lesions similar to those caused by iodoform, with the occasional production of gangrene.² Many of

FIG. 50.



Rhus radicans: leaf one-half natural size (Culbreth).

the articles employed therapeutically by the dermatologist should be placed in the same category. Green,³ of London, reports œdema of the skin followed by desquamation, resulting from the application to it of the ointment of ammoniated mercury in the strength of 2 drachms (8.) to the ounce (30.).

Leszinsky reports a case of dermatitis of the face following the use of a "triple extract of heliotrope" as a toilet-preparation.

An exceedingly common source of dermatitis is urine retained upon underclothing of adults. A persistent dermatitis of the scrotum, the perineum, or the inner faces of the thighs in either sex, always calls for examination as to whether a few drops of urine are not left in contact with such underclothing after each act of micturition. Fistulæ, urinary incontinence, prostatic disease, "stammering

¹ Harrington, Amer. Jour. Med. Sci., 1900, cxix., p. 1, report of 18 cases and review of 118 cases from literature.

² Dubreuilh, La Presse méd., 1901, liii., p. 233.

³ Brit. Med. Jour., 1884, i., p. 853.

of the bladder," imperfect finish of the *coup de piston* in men, especially after a gonorrhœa and similar troubles, are all to be remembered.

The eruption produced by the *Poison-ivy* and other varieties of *rhus* is almost exclusively an American disease; and from its frequency in the United States has attracted a great deal of attention. A certain degree of susceptibility to the poisonous action of the plant is requisite for the production of its effects, as some individuals can handle the leaves of the plant with impunity, while others, it is claimed, are affected by its exhalations within a circle having a radius of several feet. It is, however, difficult to demonstrate the truth of the last statement, suspecting, as one may, that such instances may be cases of contact with other than the suspected plant. The parts commonly affected are the hands and the regions to which the latter are carried, such as the face, the genitals, the arms, the thighs, and the neck; barefoot children suffer in the feet and the legs. Usually the symptoms are developed in the course of a few hours, and they consist of erythematous patches; scanty or profuse vesiculation with abundant serous weeping after rupture of the lesions; swelling, œdema, and disfigurement; and intense burning and itching sensations. Serious effects are occasionally produced. Deeply attached scars may result from subcutaneous abscesses of parts greatly swollen. Occasionally in particularly sensitive skins the eruption spreads from the skin-surface affected by the poison to that where presumably none has been applied. It should be remembered, however, that articles of clothing may for brief periods of time furnish sources of further trouble, being worn at the moment of contact with the plant, then laid aside, and, the occasion quite forgotten, being subsequently employed. Thus, a pair of undressed-kid gloves after lying for two weeks untouched have sufficed to awaken the disease.

A number of cases of dermatitis have originated in some parts of the Orient from contact with the varnish employed in the finishing of lacquered ware. This lacquer is manufactured from a *rhus* varnish. A few instances of such dermatitis have occurred in America from handling newly imported articles of this class.

Diagnosis.—An acute dermatitis appearing suddenly on regions of the body readily exposed to toxic agents should always arouse suspicion of dermatitis venenata. A history of contact with some irritating substance can usually be obtained. The inflammation in the beginning is limited to the areas with which the toxic agent came in contact, is often asymmetrical, and has no relation to the general health of the patient. The process often reaches the point of greatest intensity within a day or two after its first manifestations, and subsides soon after removal of the cause.

The peculiar features of ivy-poisoning have been described in a monograph on the subject by White, of Boston.¹ According to this

¹ New York: D. Appleton & Co., 1878, from the March number of N. Y. Med. Jour. of the same year.

author, the lateral surfaces of the digits first exhibit the symptoms of the eruption, later the dorsal surfaces, and latest the thickened palms. The efflorescence also is more irregularly distributed, more uniformly vesicular, and the vesicles are less transparent than in eczema. The lesions, moreover, are more vesicular and less papular at the outset, and, though suggesting papules by their situation in the palm, are in that situation readily made to exude serum by puncture with a needle.

Treatment.—Internal medication is not required. The local treatment is that of acute eczema. Black-wash (preferably dilute), solution of sugar of lead, or oleated lime-water may be employed at first, and be followed later by dusting powders. In two instances under our observation a dermatitis due to formalin, and which had resisted other treatment for months, yielded readily to radiotherapy. A number of other cases due to unrecognized agencies have responded equally well to this treatment. (For technique, see Psoriasis.)

In ivy-poisoning the application of an alkali, for the purpose of neutralizing the poisonous volatile alkaloid in the leaves of the plant (toxicodendric acid, Maisch), should evidently be considered solely with a view to prophylaxis, as it is difficult to understand how such neutralization can control the inflammatory process after its onset. An ointment made by incorporating a decoction of the inner bark of the American spice-bush (*Benzoin odoriferum*) with cold-cream salve affords prompt relief in cases in which it is employed, the difficulty lying in securing the bark of the shrub in its young and tender state.

Many topical remedies have been vaunted as specifics for the relief of this disorder, from the brine of a pork-barrel to a decoction of the leaves of the plant itself. As the eruption usually subsides when the skin is protected and not irritated by the local treatment, it is not difficult to explain the result in most cases, though it is possible there is a parasitic or toxic element in the poison. Complete covering of the affected area with flexible collodion frequently is effective, and if applied to the lesions when they first appear often will abort the disease. In later stages, care should be taken in opening the vesicles to prevent their contents from coming in contact with unaffected areas of the skin. After emptying the vesicles with a sterile needle, the involved areas may be painted several times with a 50 per cent. solution of ichthyol, and when dry covered with a dusting-powder and light bandage. Sodium hyposulphite, 1 drachm (4.) to the ounce (30.), often gives good results when applied as described above or as a wet dressing. Corrosive-sublimate lotions; saturated solution of boric acid; Carron oil; tincture of iron; bromine, 15 drops (1.) to the ounce (30.) of olive-oil (Brown); dilute nitric acid; sodium bicarbonate; saturated solution of potassium chlorate; and grindelia robusta, 1 drachm (4.) of the fluid extract to 8 ounces (240.) of water, have each been found useful.

DERMATITIS CALORICA.

Burns.—A burn is a destruction of the skin by heat or chemical action for the relief of which all dead tissues must be separated from the living and repair effected by the formation of scar-tissue or the growth of new skin. Even where there is simply an erythema with slight inflammatory reaction there is a superficial destruction of tissue. The two processes of repair; separation and reproduction, proceed *pari passu*.

Rays of heat and heated objects at a temperature from 125° to 175° F. produce immediately, or after a brief interval, first, an erythema, which disappears when the source of the heat is removed; second, after more prolonged exposure, the symptoms of active inflammation and exudation. Vesicles or bullæ, isolated or confluent according to the severity of the cause, may rise from a reddened skin which is usually intensely painful. These lesions are persistent or are transitory, and are generally filled with a clear serum, which exudes and dries into crusts after rupture of the chamber in which it was imprisoned. At other times the exudation is so abundant that the epidermis rises in broad plates, from beneath which the serum is exuded. This process may terminate by a free production of pus upon the surface and gradual resolution. Adenopathy is a frequent concomitant symptom. In such dermatitis of extensive areas of the skin the intensity of the process may awaken a violent fever, or death may result from shock or exhaustion.

In yet severer grades there is the production of an eschar, which is dry, brown, blackish, and destitute of all signs of vitality; or as Kaposi describes it, is dense, coriaceous, and white as alabaster, though upon the eschar some vesicles appear, and by their presence suggest a false conclusion as to the vitality of the tissues upon which they rest. In from eight to ten days the slough is removed by suppurative processes leaving a granulating surface which bleeds readily when touched; it is frequently studded with pin-head-sized, white islands which are points of regenerated epithelium budding from partly destroyed cutaneous glands. These islands of epithelium extend and coalesce effecting the repair of extensive areas. In such cases the scar which results may consist of penny-sized circular areas of normal integument representing these islands, interspersed with scar-tissue. If the destruction of tissue is deeper granulation and the production of deforming, contracting scar-tissue results. The characteristics of the scar thus produced are: its great irregularity, its tendency to stellate radiation, and the production of ridges, folds, pockets, and bridges.

Burns involving one-third the body-surface are of grave portent, and those affecting one-half the body are generally fatal, even though for from twenty-four to forty-eight hours there may be little complaint of pain. The causes of death in these fatal cases are generally obscure, as the post-mortem results are usually negative. Gastric

and duodenal ulceration, however, is often recognized. Overheating of the blood, heart-paralysis, oligocythæmia, and actual destruction of leucocytes have all been supposed to be effective in bringing about dissolution. In cases in which life is prolonged to the third day the complications of pyæmia, erysipelas, and tetanus may arise. Lastly, exhaustion following fever, suppuration, hemorrhage, and visceral affections may lead to fatal results.

Treatment.—In the treatment of the simplest burns, rest, lotions of lead-water, and cool water, with the application of compresses, are usually sufficient to secure relief; occasionally, dusting-powders may advantageously be substituted. In the cases in which serum is brought rapidly to the surface, with the production of vesicles and bullæ, the latter should be punctured skilfully to give relief to the tension by the evacuation of their contents, but the roof-wall should be preserved, as it may subsequently form an attachment to the exposed derma beneath. For the relief of the severe pain experienced immediately after the burn the use of carron oil and bandaging the part had best be employed. Where the burn is sufficiently extensive to confine the patient to bed the open air treatment may be employed to advantage. Continuous immersion in water having the temperature most agreeable to the patient, as practised by Hebra in cases of severe and extensive burning, produces a speedy and certain amelioration of the pain and a favorable condition of the wounds, though it does not avert a fatal issue in any dangerous case.

The strictest antiseptic precautions are demanded when the suppurative process in the skin is both active and extensive. In some cases disinfection with a 5 per cent. solution of carbolic acid, or a 2 per cent. resorcin solution, should be followed by the application of protective silk wet with a 5 per cent. solution of sodic biborate or bicarbonate, and the whole enveloped either in borax-lint, antiseptic (mercuric iodide) wool, carbolized gauze, or salicylated cotton; over all, impermeable rubber tissue should be wrapped. Instead of the protective silk, it is often better to use strips of sterile moist rubber tissue, $\frac{1}{4}$ of an inch wide. These are laid smoothly and evenly over the surface with narrow spaces between each. The first layer then is crossed by a second at right angles to the first. The surface is thus practically covered with the rubber tissue, leaving, however, at each crossing of the strips small openings for the escape of secretion. Boric acid water, or other feebly antiseptic solutions, may then be applied and changed as often as necessary without damage to the surface beneath.

Skin-grafting may be required to cover the extensive ulcers left by the larger burns.

DERMATITIS CONGELATIONIS.

Congelatio, or dermatitis from congelation, presents usually in the milder forms circumscribed erythematous patches or plaques, generally recognized under the name of *Pernio*, or chilblain, seated upon

the digits or, more rarely, upon the face, and occasioning a disagreeable sensation of heat, smarting, or itching, especially after the chilled part has been warmed.¹ Chilblains are bluish or purplish red in color, and are often seated on a slightly œdematous integument. They are generally cool to the touch when subjectively hot. Authors have claimed that anæmia is a chief predisposing cause of the complaint, but it frequently occurs in perfectly healthy young people. Sir Erasmus Wilson has suggested that some cases of so-called "lupus erythematosus" of the hands belong to this category.

In the second grade of inflammatory reaction, following the state of contracted blood-vessels and pallid integument produced immediately by the action of cold, bullæ and vesicles form, with underlying ulcers in severe cases.

In the third grade gangrene may occur, with and without the formation of bullæ. The frozen part may become insensitive, white, and cold, without the circulation in it of blood- and lymph-currents. From this condition reaction occurs, with the formation of an eschar, differing after the death of the patient according to the severity of exposure to cold. If, however, beside the interference with the circulation, the tissue itself has been destroyed, when reaction occurs the part falls at once into gangrene; or there form bullæ larger than those described above, filled with sanguinolent serum; or the skin is smooth, marbled with bluish lines, whitish, cold, and insensitive. Mortification ensues, followed by the well-known phenomena of the "line of demarcation," and, in favorable issues, suppurative separation of the dead part, granulation, repair, and cicatrization. As the injuries induced by congelation are more frequent upon the extremities, the bones, especially those of the digits, largely participate in the losses of tissue. Septicæmia and a fatal result may follow.

Treatment.—Chilblains are treated internally by the ferruginous tonics, particularly the tincture of iron, externally by stimulant applications, such as those containing iodine, camphor, carbolic acid, tincture of benzoin, and balsam of Peru. Kaposi recommends:

R	Pulv. camphoræ,	gr. x;	66
	Cretæ præparat.,	ʒij;	30
	Ol. lini,	ʒij;	60
	Balsam. Peruvian.,	℥xx;	1 33 M.

Frictions, with or without medication, are generally useful. The parts are to be carefully protected from pressure and undue friction-effects.

Painting the part frequently with a 50 per cent. aqueous solution of ichthyol, or the application of an ointment containing 2 drachms (8.) of ichthyol to the ounce (30.) gives good results in many cases.

Dilute nitric acid and peppermint-water in equal proportions, painted over the part for three or four successive days, have been recommended by Lapatin for the treatment of frost-bitten fingers and

¹ Consult the chapter devoted to the Erythemata.

toes. Hydrochloric and pyroligneous acids, lemon-juice, 50 per cent. and stronger solutions of lead acetate, both in lotions and poultices, are also recommended. Meurisse advises in the management of both severe ambustio and congelatio that goldbeater's skin be employed over any salves or lotions applied to the affected surface.

In cases of severe congelation the circulation is to be cautiously restored by friction performed in an apartment the air of which is cool, to prevent too energetic reaction. Friction with snow is employed with safety in America and on the steppes of Russia, where these accidents are frequent and are grave in results. Perseverance for hours in this course is often rewarded with success in apparently desperate cases. Antiseptic dressings are usually demanded when sloughing and ulceration ensue.

DERMATITIS MEDICAMENTOSA.

(DRUG ERUPTIONS. *Ger.*, ARZNEIEXANTHEME; *Fr.*, ÉRUPTIONS MÉDICAMENTEUSES.)

The importance of recognizing the fact that a given eruption is produced by an ingested drug can scarcely be overestimated from the point of view of the diagnostician. The errors committed in this connection are so frequent and so annoying to the patient that it is necessary for the physician to inquire very carefully, before treating any cutaneous disease, as to the medicaments previously swallowed by the patient, and also to be prompt to connect any aggravation of a cutaneous disease with remedies ordered by himself for internal use. The following is but an imperfect list of the drugs the internal administration of which may be followed by an exanthem—imperfect, because without question many have yet to be recognized as possessing such an action. As to the *modus operandi* of such medicinal agents, for the most part our knowledge on this subject is purely conjectural. Some, for example potassium iodide, are eliminated in part by the glands of the skin, and presumably have thus a local effect upon such emunctories; others, and in this class, probably, should be included quinine, induce an urticaria scarcely to be distinguished from an *urticaria ab ingestis*. Some operate, possibly, in either or both ways at different times or in different individuals. The absurdity of supposing that any disease can be "driven out" by the ingestion of such drugs should be relegated to the specious ignorance which first framed such an hypothesis.¹

Acids capable of producing macules, papules, erythema, desquamation, etc., are carbolic, nitric, tannic, benzoic (and sodium benzoate), and boric (and sodium borate).

Aconite is said to be productive at certain times of marked diaphoresis with the occurrence of vesiculation and considerable itching.

¹ For full details and bibliography of this subject, consult the treatise on Drug-eruptions, by Prince A. Morrow, New York, 1887; and chapter by Ehrmann in Mraček's Handbuch, vol. i., p. 639.

The diaphoresis in an irritable skin may be responsible for the trouble.

Antifebrin and Acetanilid occasionally produce an erythematous or maculo-papular exanthem, or, when long continued, may cause partial cyanosis.

Antipyrin and Other Remedies of its Class (manufactured by the action of glacial acetic acid upon the petroleum-products).—Ernst¹ has been followed by many observers in recording rashes resulting from the administration of antipyrin. The symptoms are discrete and confluent patches of bright-red, scarlatiniform, erythematous, and pruritic macules or papules. Veiel² reports œdema with bullæ upon the lips and toes, and over the palate, with urticarial lesions of the palms and soles, after ingestion of antipyrin. Brock, Darier, and others have reported cases in which antipyrin has produced a more or less persistent erythema in the form of isolated, scattered, sharply defined plaques. These plaques are usually few in number, and they tend to return in the same sites whenever the susceptible individual ingests the drug. The redness and pigmentation may persist for several weeks. Wickham reports an antipyrin-rash which simulated perfectly a macular syphiloderm.³

Antitoxin.—(See Serum Eruptions.)

Arsenic.⁴—Erythematous, vesicular, papular, and much more rarely pustular, bullous, and ulcerative lesions occur upon the face, the back, and the hands after the ingestion of arsenic. The well-known effects of the administration of the drug in toxic doses upon the mucous membranes of the eyes, nose, and mouth need not be described in this connection, nor yet the grave gangrenous symptoms, with osseous necrosis, that have been observed in workers in the metal.

A bright-red, scarlatiniform blush with a few isolated vesicles has covered both shoulders of a young woman with a delicate skin after taking three medicinal doses of Fowler's solution, the eruption being present but less distinct upon her face and hands. In two cases the rash in polymorphic type was limited to the hands alone.

Young patients who have taken arsenic in the largest medicinal doses for relief of chorea often present as a result a dark discoloration chiefly of the skin of the chest and the neck, but also of other parts of the body. This discoloration is suggestive of the bronzing seen in Addison's disease. In some instances there are no other cutaneous symptoms. Guaita and Liège noted these phenomena usually in the fifth month after ingestion of the drug.⁵

Long-continued use of arsenic may produce keratosis of the palms

¹ *Centralb. f. klin. Med.*, 1885.

² *Archiv*, 1891, xxiii., p. 33.

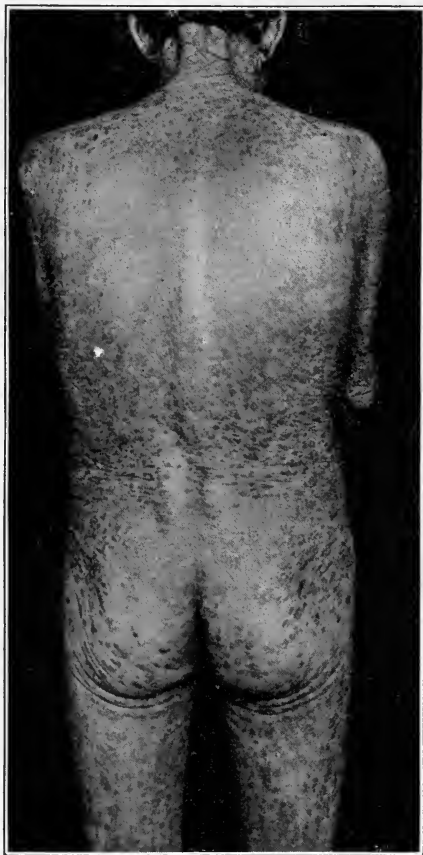
³ *Cf. Berliner Monatshefte*, 1902, xxxv., p. 137 (with review of literature).

⁴ *Cf. Brooke-Roberts*, "The Action of Arsenic on the Skin as Observed in the Recent Epidemic of Arsenical Beer-poisoning," *B. J. D.*, 1901, xiii., p. 121.

⁵ *Cf. Hamburger*, "Arsenical Pigmentation and Keratosis," *Johns Hopkins Hosp. Bull.*, 1900, xi., p. 87.

and soles of a severe grade, obstinate character, and occasionally grave results. Administered for relief of psoriasis, the resulting keratoses have later developed into epitheliomata of malignant type.¹

FIG. 51.



Generalized pigmentation and keratosis following long-continued use of arsenic.

By far the largest number of rashes are, however, produced in persons previously suffering from the cutaneous disease for the relief of which the drug is administered. Here the toxic effect is declared by either—first, increased hyperæmia of the skin, visible in an erythematous patch, or beneath the scales of a squamous patch, or as an areola of bright-red hue about any aggregation of lesions; second, by simple aggravation of the type of a disease already in existence (recurrence of acuity in a subacute eczema); third, by rapid peripheral extension of a disease which had previously been well limited in contour; fourth, by converting a disease exhibiting uniformity of

¹Hartzell, *Amer. Jour. Med. Sci.*, 1899, cxviii., p. 265; and Darier, *Annales*, 1902, iii., p. 1126.

lesions into one characterized by multiformity. Each of these results might be illustrated by cases.

In a series of eight cases of poisonous effects produced by arsenical paper-hangings, and reported by Brown,¹ there were, curiously, no cutaneous symptoms.

Belladonna.—The well-known erythematous, scarlatiniform, or reddish efflorescence produced by belladonna and its alkaloids is usually limited to the upper segment of the body, but it may become generalized. It is said to occur more frequently in children, probably because it has been administered largely to individuals of that age under the delusion that it is useful as a prophylactic in scarlatina. Very disagreeable and even dangerous results have followed the instillation into the eye of atropine as a mydriatic, the rash being accompanied by constitutional symptoms.

Boric Acid.²—Erythema, papules, vesicles, bullæ, and lesions resembling those of erythema multiforme (Fordyce) are reported as following the ingestion, or absorption, of boric acid. A mild form of acute exfoliative dermatitis, with temporary loss of hair, is recorded as occurring after prolonged use of the remedy.

Modadewkow reports a case in which the pleura was washed out with a 5 per cent. solution of boric acid, a part of which was not removed. There occurred as a result an erythematous rash over the face, the trunk, and the extremities.

Bromine and its Compounds.—A full account of the cutaneous effects of bromine and its compounds, when administered internally, is contained in a paper on medicinal eruptions, read in 1880, by Van Harlingen, of Philadelphia, before the American Dermatological Association. Acneiform lesions, pustules, macules, maculo-papules, papules, eczemaform moist patches, furuncles, urticarial wheals, scales, and ulcers have been induced by swallowing the bromides of potassium, sodium, ammonium, and lithium. By far the commonest are the acneiform and pustular lesions, occasionally accompanied by pruritus, which appear upon the face and the upper portion of the trunk, though the rash may be very distinct upon the genital region. Duhring reports an interesting observation of a patient in whom the eruption simulated closely the maculo-papular syphiloderm, the patient having taken a bromine salt for three years. The eruption first appeared within five or six days after decreasing the dose. Kaposi observed a case of bromide-rash in a nine-months-old suckling, the mother having taken 120 grammes of potassium bromide in two months, herself exhibiting no traces of eruption.

A remarkably characteristic exanthem is produced by the administration of potassium bromide, especially to infants and young children. The lesions are condylomaform, quite numerous, conspicuous about the face and neck, where they are packed closely together, but they are also seen on other parts of the body. The small coin-

¹ Paper read before the Boston Society for Medical Observation, March 6, 1876.

² Cf. Wild, *Lancet*, 1899, i., p. 23 (with bibliography).

nut-sized elevated nodules are usually flattened; and they often resemble carbuncles, as they have a cribriform summit on which multiple points of imprisoned pus are visible. This rash, though rare, has been carefully studied and well illustrated by chromo-lithographic reproductions.

T. C. Fox and Gibbes report these condylomaform nodules in the case of an infant in which the histology of the lesions was carefully studied; and Fay in a child eleven months old also recognized an exanthem which had been mistaken for molluscum epitheliale. These lesions are somewhat similar to the condylomaform rash seen in children after the administration of potassium iodide. The lesions may appear for some weeks after the drug has been discontinued.

Browse, of Cambridge, England, recommends for relief of these symptoms the application of a solution of salicylic acid, 1 grain to the ounce (0.066–30.) of water, frequently applied on lint, he having successfully treated in this way sores as large as the palm of the hand.

Cannabis Indica.—An eruption produced by the ingestion of this drug was observed by me in the case of an adult male, who was covered extensively with papulo-vesicular lesions after swallowing 1 grain (0.066) of the extract.¹

Cantharides.—Erythematous and papular eruptions are reported in a few instances.

Capsicum.—Erythema results occasionally. Allen reports a papulo-vesicular eruption following the internal use of the drug.

Chloral.—An erythematous rash is the commonest of the eruptions produced by chloral, though wheals, red and yellowish papules, vesicles, pustules, and petechial blotches have been observed. The rash occurs upon the face, the neck, the trunk, and the limbs, of the latter especially on the extensor surfaces. In a man of advanced years and totally deaf, who had slept only under the influence of chloral for four years, discrete scaly patches as large as saucers covered the hands and the lower extremities.

Martinet² reports an erythematous and scarlatiniform rash, occasionally commingled with urticarial and purpuric lesions, occurring upon the face and neck, the front of the chest, the extensor surfaces of the larger joints, and the dorsum of the hands and feet. There was no pyrexia nor indisposition, but in some cases there were dyspnoea and cardiac palpitation.

Chloralamid.—Pye-Smith reports a case in which this drug produced a scarlatiniform eruption, involving the mucous membranes, accompanied by fever, and terminating in free desquamation.

Chloroform.—During inhalation an erythema of short duration, and rarely, purpuric spots are noted.

Cod-liver Oil.—According to Farquharson, cod-liver oil after being

¹ New York Med. Record, May 11, 1878.

² Thèse de Paris, 1879.

swallowed is capable of producing an acne. This result is traceable to the use of inferior qualities of the oil.

Condurango.—Guntz¹ reports the occurrence of furuncular and acneiform lesions in twenty patients out of one thousand who were taking condurango for the relief of syphilis.

Copaiba and Cubebs.—Occasionally the ingestion of copaiba is followed by a vividly red rash, in the form of discrete macules, more rarely maculo-papules, invading chiefly the lower segments of the extremities and the skin of the belly, but often completely covering the body-surface. The rash may occur in dark mulberry-red petechiæ, and always is accompanied by pruritus. Inasmuch as the drug often is administered for the relief of a venereal disorder not syphilitic, care should be taken not to confound the eruption it may excite with the early macular syphiloderm. Cubebs is followed much more rarely by a similar result.

Digitalis.—In Behrend's treatise on Diseases of the Skin² reference is made to cases in which macular and maculo-papular rashes succeeded the ingestion of digitalis.

Ergot rarely gives rise to vesicles, pustules, small furuncles, or petechiæ. Circumscribed areas of gangrene on the extremities are more common.

Iodine and Its Compounds.³—Potassium iodide is responsible for the larger number of all eruptions among medicinal rashes. The frequent employment of this drug and the very marked influence it possesses over the skin render the study of these morbid results important. Unlike many of the other substances in the list of drugs, the iodine compounds are followed by some species of rash in probably the larger number of all persons who swallow them. As is true also with the bromine compounds, the eruption may persist, or even first appear, after the drug has been discontinued.

The resulting lesions may be macular, papular, vesicular, bullous, pustular, petechial, multiform, or may be circumscribed subcutaneous abscesses. In appearance the rashes produced by iodine and its compounds may simulate those of every other dermatitis.

The macular rash is seen best fully developed over the upper extremities in discrete erythematous patches or as a diffuse blush. Generally the rash is displayed symmetrically. The hands are often affected, and suggest in appearance the hands of the anilin-worker. The rash assumes at times the papular type with special production of papules upon the face.

Berenguier describes a scarlatiniform rash of sudden occurrence with numerous minute discrete vesicles upon the surface of the skin. Eczemaform eruptions with abundant serous exudation are also reported.

¹ Vierteljahr., 1882, ix.

² Braunschweig, 1879.

³ Cf. D. W. Montgomery, Trans. Med. Soc. of State of Cal., 1900, review of subject with bibliography; and Rosenthal, Archiv, 1901, lvii., p. 3, review of subject with account of histological changes in one case.

A number of cases are on record in which the administration of the drug was followed by the production of bullæ. Bumstead, Taylor, Duhring, Tilbury Fox, Finny, and I have described such bullæ in adults as well as in children.¹ Hallopeau² also reports a fatal case in which a bullous eruption followed the ingestion of potassium iodide. The eruption occurred chiefly about the head and neck and the upper extremities. The significant rarity of vesicular

FIG. 52.



Papilloma, due to the ingestion of the iodine compounds.

and bullous lesions in acquired syphilis suggests that at least some of the cases on record were those of rashes induced by the remedy given for the relief of the disease.

A careful analysis of these bullous rashes leads to their division into three categories: first, those occurring, often with fatal results, in cachectic adult patients; second, those occurring as part of the eruptive lesions in a polymorphic group; third, those occurring in well-

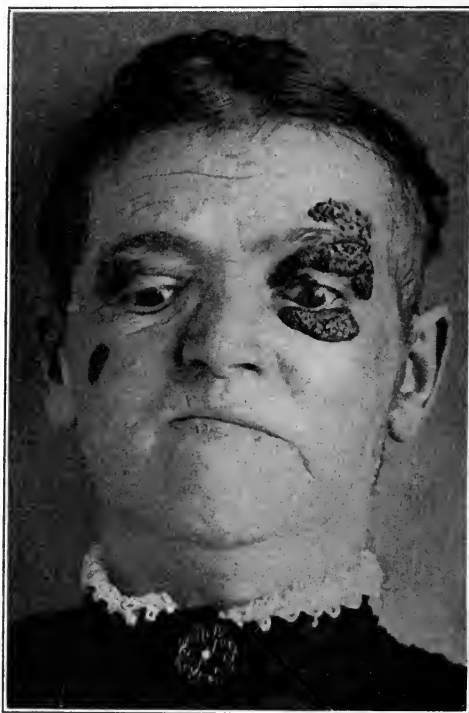
¹ J. C. D., 1886, iv., p. 383.

² Union méd., 1882, xxx., p. 481.

nourished children, and taking on the appearance of molluscum epitheliale and condyloma-lesions, usually compounded of papulo-vesicles and pustules. Erythemata of a similar type have also been recognized after the ingestion of potassium bromide by infants.

The pustules induced by the administration of iodine compounds are seen chiefly upon the face, the neck, the trunk, and the arms. They are usually seated upon a firm base, and may be followed by cicatrices. Duhring has seen an annular patch upon the forehead,

FIG. 53.



Dermatitis medicamentosa. (Howard Fox.)

made up of minute vesico-pustules, which eventually developed into a globular violaceous mass nearly two inches in diameter. Large, cherry-sized, tubercular or papillomatous elevations abruptly rising from the surface of the integument may present a cribriform structure which shows the open ducts of several suppurating follicles (chin, cheek, nose). A few cases are reported in which fungating tumors were found, producing an appearance almost identical with that of mycosis fungoides. Neumann¹ calls attention to the fact that these severe forms of iodide-eruption occur in patients suffering from albuminuria.

The purpuric rash occurs in petechial macules, discrete and mi-

¹Archiv, 1899, xlviii., p. 323.

liary, situated chiefly on the lower extremities. In a case reported by Mackenzie (quoted by Van Harlingen) a dose of $2\frac{1}{2}$ grains (0.166) taken by an infant was followed by a fatal result after petechiæ appeared.

Iodoform.—The internal administration, or the absorption through wounds, of this drug has been followed by macular, papular, vesicular, bullous, petechial, and mixed eruptions. Grave, and even fatal, systemic results are noted, including fever, delirium, emaciation, and nephritis. (For the local effects of the drug see *Dermatitis Venenata*.)

Jaborandi and Pilocarpine are capable, when ingested, of inducing free diaphoresis; erythematous macules, wheals, and pinhead-sized papules have been seen upon the surface as a result.

Mercury.—Mercury when ingested is reported to have produced an erythematous rash upon the surface of the skin. In view of the fact that the metal has been, in its various compounds, administered for so long a period of time and for so many various diseases, without the production of cutaneous symptoms, it is a fair hypothesis that in the few reported cases there was coincidence rather than causation. Mercurials when applied to the external surface of the body are, as is well known, capable of exciting, in various degrees, cutaneous irritation and inflammation.

Opium and its Alkaloids.—Erythema, wheals, and occasionally intense pruritus, with œdema, and subsequent desquamation, have followed the ingestion of opium and several of its alkaloids, notably morphine. In its mildest expression this cutaneous effect is limited to a characteristic itching about the nostrils that can be perceived in a large proportion of all patients as soon as the general effect of the opiate becomes apparent. In some patients there may follow an intense and distressing general pruritus without efflorescence, and it is certain that the subsequent urticarial efflorescence is caused by the free diaphoresis which the medicament induces. This fact is a matter of practical moment, as the use of an anodyne for the purpose of procuring sleep for a patient tormented with a nocturnal pruritus would seem to be occasionally indicated. Inasmuch as chloral, potassium bromide, and the opiates are all capable of aggravating such distress, great caution is needful in such emergencies. In general, it may be said that the employment of these and similar remedies for the relief of pruritus should be interpreted as a confession of weakness on the part of the physician, who ought to be able to alleviate the distress of his patient by a judicious employment of topical remedies.

Petroleum and its products are responsible for a large list of medicamentous rashes (see *Antipyrin*, etc.).

Phosphorus.—Hasse (quoted by Van Harlingen) cites the case of a young girl who exhibited a pemphigoid rash after the ingestion of phosphoric acid. According to Farquharson, phosphorus itself is occasionally responsible for purpura with gastro-intestinal derangement and jaundice preceding a fatal issue.

Podophyllin.—Winterburn¹ reports that those who work in resinoid podophyllin are liable to suffer, as a consequence of this exposure, from a cutaneous disease of the scrotum.

Potassium Chlorate.—Stelwagon and others report that papules and macules have followed the use of this remedy, administered in the form of tablets.

Quinine, Cinchona, and Cinchona Alkaloids.—Morrow² collected the records of over sixty cases of quinine-exanthem, and he shows that its prevailing type is exanthematous, the rash being of a vivid hue, disappearing on pressure, and resembling scarlatina. Other lesions produced are wheals, papules, vesicles, petechiæ, hemorrhagic purpura, bullæ, and in one instance an intense localized dermatitis with beginning gangrene of the scrotum. In some of the cases the rash appears on repetition of the dose, and even after recourse to other alkaloids. The subjects are mostly women. As with most of the other exanthem-producing drugs, small doses suffice for the effect where the idiosyncrasy exists. The rash has been studied in an adult male, who, after taking 2 grains (0.133) of quinine sulphate for the first time in six years, exhibited an efflorescence (over the entire surface of the body) of discrete finger-nail-sized, salmon- and pinkish-tinted, scarcely elevated patches, accompanied by moderate pruritus. A repetition of the dose was followed by a recurrence of the exanthem.

In several cases desquamation is reported as resulting from the rash. As to the occurrence of the general symptoms recognized under the title "cinchonism" (tinnitus aurium, etc.), these may and may not accompany the lesions. Morrow makes the pertinent suggestion, in view of the frequent similarity of the rash to that exhibited in scarlatina, that many cases hitherto recorded as recurrent attacks of that disease and measles, with other anomalous cutaneous eruptions, may have been instances of quinine-exanthem.

Salicylic Acid and the Salicylates.—Reports of cases in which these substances after ingestion produced cutaneous symptoms have been made by Heinlein, Wheeler, and Freudenberg, all cited by Van Harlingen. The symptoms were diffused redness, urticarial lesions, vesicles, pustules, petechiæ, and vibices, accompanied by intense pruritus and followed by desquamation. Engman³ reports an interesting case, including the histology of the lesions.

Salipyrin.—(Edema of the skin and actual loss of tissue have resulted from the administration of gramme doses of salipyrin to a man aged fifty-four years (Schmey).

Santonin.—A generalized eruption of urticarial lesions seated upon a reddened surface and accompanied by œdema is reported by Sievking as occurring in a child to whom santonin had been administered as a vermifuge.⁴

¹ Louisville Med. News, 1882, xiii., p. 187.

² N. Y. Med. Jour., 1880, xxxi., p. 244.

³ J. C. D., 1899, xvii., p. 555.

⁴ Brit. Med. Jour., February 18, 1871.

Serum Eruptions.¹—Tuberculin, diphtheria-antitoxin, and the various vaccines used as therapeutic measures frequently produce in susceptible individuals cutaneous exanthems. As the antitoxin of diphtheria is used so commonly to-day, the exanthems produced by its employment should be recognized.

FREQUENCY.—Owing to the fact that different serums produce eruptions in varying proportions, and also to the fact that accurate records are kept chiefly in hospitals where the injections are used as a routine measure, and also by a few men specially interested in the matter, the exact proportion of persons displaying eruptions in relation to the whole number treated is difficult to determine. Hartung collected data from the literature on the subject and from the reports of twelve observers found 294 eruptions resulting from 2661 injections, an average of 11.4 per cent.

DATE.—The appearance of these eruptions may occur from one to thirty days after the injection. The majority appear from the sixth to the tenth day.

CHARACTER.—The important exanthems in the order of frequency of occurrence are the following: Urticarial, polymorphous, erythematous, scarlatiniform, morbilliform, vesicular and bullous, and purpuric. The last three are rare. The majority are urticarial, and may be ordinary urticarial wheals or urticarial erythema. The scarlatiniform and morbilliform varieties closely resemble the diseases after which they are named. Mixed types are common and aid in diagnosis. Edema, especially of the face, about the eyelids, also of the penis, scrotum, and feet is not infrequently noted in association with these eruptions. The distribution of the lesions is irregular. While they may occur on any part of the cutaneous surface, the sites of predilection are about the arms, legs, buttocks, and trunk. The face occasionally may be attacked. The first appearance of the eruption is commonly about the site of injection. It is frequently noted that the eruption appears within twenty-four hours at the site of the injection and soon clears but reappears later generalized. The extent of the eruption varies from a few isolated scattered patches to a profuse exanthem, involving almost the entire cutaneous surface. Its duration is commonly about two, but it may persist for three, four, or five days. Purpuric lesions naturally persist for a longer period. The eruption may recur within a few days after disappearance, or after some weeks. The dates of recurrence vary from three to seventeen days. More than one recurrence may happen.

These rashes are commonly accompanied by constitutional disturbance of varying degree. There is usually a rise in temperature with its accompanying symptoms. While this rise usually does not exceed 101° to 102°, it may be as high as 105°. The fever lasts from one to three days, subsiding with the disappearance of the eruption. Headache, a certain amount of prostration, and arthralgia

¹ Welch and Schamberg, *Treatise, Acute Contagious Diseases*, pp. 754-760.

are common accompaniments. The joint pains are valuable aids in diagnosis.

It is believed that these cutaneous manifestations are induced by the serum *per se*, and that the antitoxic material has little to do with their production. Similar eruptions have been produced repeatedly by non-immunized serum.

Sodium Benzoate.—Rohé¹ reports two cases in which an erythematous rash, with well-defined border, accompanied by itching and slight desquamation, occurred during the use of sodium benzoate. The patients were a woman, aged thirty-five years, and a boy suffering from diphtheria. The eruption disappeared on discontinuance of the remedy, and was made successively to appear and disappear by its alternate use and disuse.

Sodium Biborate.—Gowers² reports the occurrence, especially on the arms, but also over the trunk and legs, of an eruption resembling psoriasis, after the ingestion of sodium biborate. Some of the resulting patches were one and a half inches in diameter. Three cases in all are collated. In two the eruption faded when a solution of arsenic was added to the sodium salt.

Stramonium.—Deschamps (cited by Duhring) reports an erythematous rash after the administration of the thorn-apple.

Strychnine.—Skinner (cited by Van Harlingen) reports a case in which an eruption of six weeks' duration ensued upon the administration of quinine and strychnine together; the former in the dose of $1\frac{1}{2}$ grain (0.10) the latter in the dose of $\frac{1}{4}$ grain (0.0025).

Sulphonol.—Diffuse macular and scarlatiniform eruptions are seen occasionally. Vesicular and purpuric lesions have also been reported.

Tanacetum.—A case of varioliform eruption produced by the ingestion of $1\frac{1}{2}$ drachms (6.) of the oil of tansy, administered for abortifacient purposes, is reported by Potter.³ There were antecedent clonic convulsions. The result was not fatal.

Tar and Turpentine.—Erythematous, vesicular, and papular rashes are reported as resulting from the ingestion of these substances.

Veronal.—Wills,⁴ House,⁵ Bulkley,⁶ Wooley⁷ and others have reported instances of eruptions produced by this drug. Their occurrence is due to idiosyncrasy and the lesions belong to the group of the angioneurotic dermatoses. They may be exhibited as local or general exanthems. Erythema, large maculo-papules, vesicles, oval and circular patches with dark centers resembling insect bites, scarlatiniform erythema, and œdema, especially of the face, have been described. On clearing, brownish stains and petechial spots remained for a time. Constitutional symptoms of moderate grade accompanied the general eruption.

¹ Maryland Med. Jour., 1881, viii., p. 91.

² Lancet, 1881, ii., p. 546.

³ New England Med. Jour., October 15, 1881.

⁴ W. K. Wills, Brit. Med. Jour., 1906, March 3.

⁵ Wm. House, J. A. M. A., 1907, xlviii., p. 1349.

⁶ L. Duncan Bulkley, *ibid.*, 1907, xlviii., p. 1865.

⁷ Paul G. Wooley, *ibid.*, 1907, xlix., p. 2153.

The following medicaments may be added to the list of drugs capable of producing rashes when administered by the mouth:

Anacardium, alcohol, bitter almonds, antimony, argenti nitras, benzol, chinolin, bitter-sweet, capsicum, duboisin, ferrous iodide, guarana, kava-kava, creosote, resin, castor-oil, ipecacuanha, hyoscyamus, lactophenin, matico, lead and its compounds, mesotan, sulphur and calcium sulphide, veratrum viride, cocaine, conium, pimpinella, rhubarb, and valerian.

Many of these drugs have been effective, in but few instances. There is no reason why the list should not in the future greatly be enlarged, as it is probable that every medicament is capable of producing a temporary efflorescence when the system exhibits a special sensitiveness to its action, the character of the eruption depending largely on individual idiosyncrasies, and on the circumstances (including the condition of the tissues) attending the administration of the drug.

Etiology.—In Morrow's treatise it is shown that the same drug may produce a variety of eruptive phenomena, and that the same eruptive features may result from the ingestion of different drugs. He points to what he concludes to be the neurotic origin of many of these rashes, and believes that the proof is inconclusive that they are to any considerable degree brought about by elimination, through the cutaneous glands, of the noxious element introduced with the drug. Tilden, however, calls attention to the fact that many of these eruptive phenomena are of the nature of angioneuroses, similar to Trousseau's *tache cérébrale*, requiring often increase in the irritability of the cutaneous vessels, with exudation of serum, outwandering of blood-cells, and, in case of hemorrhagic lesions, some change in the vascular walls themselves.

Diagnosis.—The diagnosis of the various medicinal rashes described above does not, fortunately, demand a recognition of the essential peculiarities impressed upon each by the exciting cause, since in many cases such peculiarities do not exist. The same drug may, on the one hand, produce a rash with symptoms widely differing in a group of patients, while, on the other hand, the urticariæ resulting from the ingestion of "head-cheese," quinine, and chloral may be indistinguishable. But to establish the fact that a medicamentous eruption is present in any given case is a long step in the direction of reaching the precise cause that has been in that case effective. This information must often be obtained from the lips of the patient. The medicinal rashes are in general remarkable for their sudden appearance, their symmetry, their diffusion over large areas of integument, the presence of pruritus, the absence of fever, and their existence alike upon exposed and protected surfaces of the skin, thus hinting at the action of some cause not operating externally. Excluding syphilis and the exanthematous fevers, a generalized rash of sudden occurrence should always raise the suspicion of a dermatitis medicamentosa. Similarly in cases of preëxisting cutaneous disease, syphilis, eczema, or psoriasis, the sudden occurrence of lesions of a

new type widely diffused, or of rapid aggravation *in situ*, or of speedy extension in the area of those already in existence, should awaken the suspicion, if there be fever, of the exanthemata, and, without a febrile process, of the medicinal rashes. Thus, have seen two patients with eczema exhibit rapid rise in body-temperature, and subsequently develop a generalized variolous rash; and it is a matter of common experience to examine patients on the eve of a macular syphiloderm, or even long past the eruptive stage of that disease, showing their faces, necks, and shoulders covered with an acneiform rash produced by potassium iodide. The practitioner cannot too strongly be urged to view with exceeding watchfulness the skin of a patient affected with any of the common disorders (eczema, acne, and psoriasis) when the eruption becomes anomalous as to type, distribution, or symptoms.

Treatment.—The medicamentous rashes, as a rule, disappear rapidly after the withdrawal of the exciting cause, and they require no further management. In some cases the soothing lotions, baths, and dusting-powders employed in the treatment of acute eczema may be required.

It should not be forgotten that the patient who exhibits these lesions is usually one who has been suffering from the real or fancied disease for relief of which the drug was taken, and that condition may require recognition and management.

FEIGNED ERUPTIONS.

(DERMATITIS FACTITIA, FEIGNED ERUPTIONS, HYSTERICAL DERMATO-NEUROSSES, HYSTERICAL GANGRENE, NEUROTIC GANGRENE, SPONTANEOUS GANGRENE, ERYTHEMA GANGRÆNOSUM.)

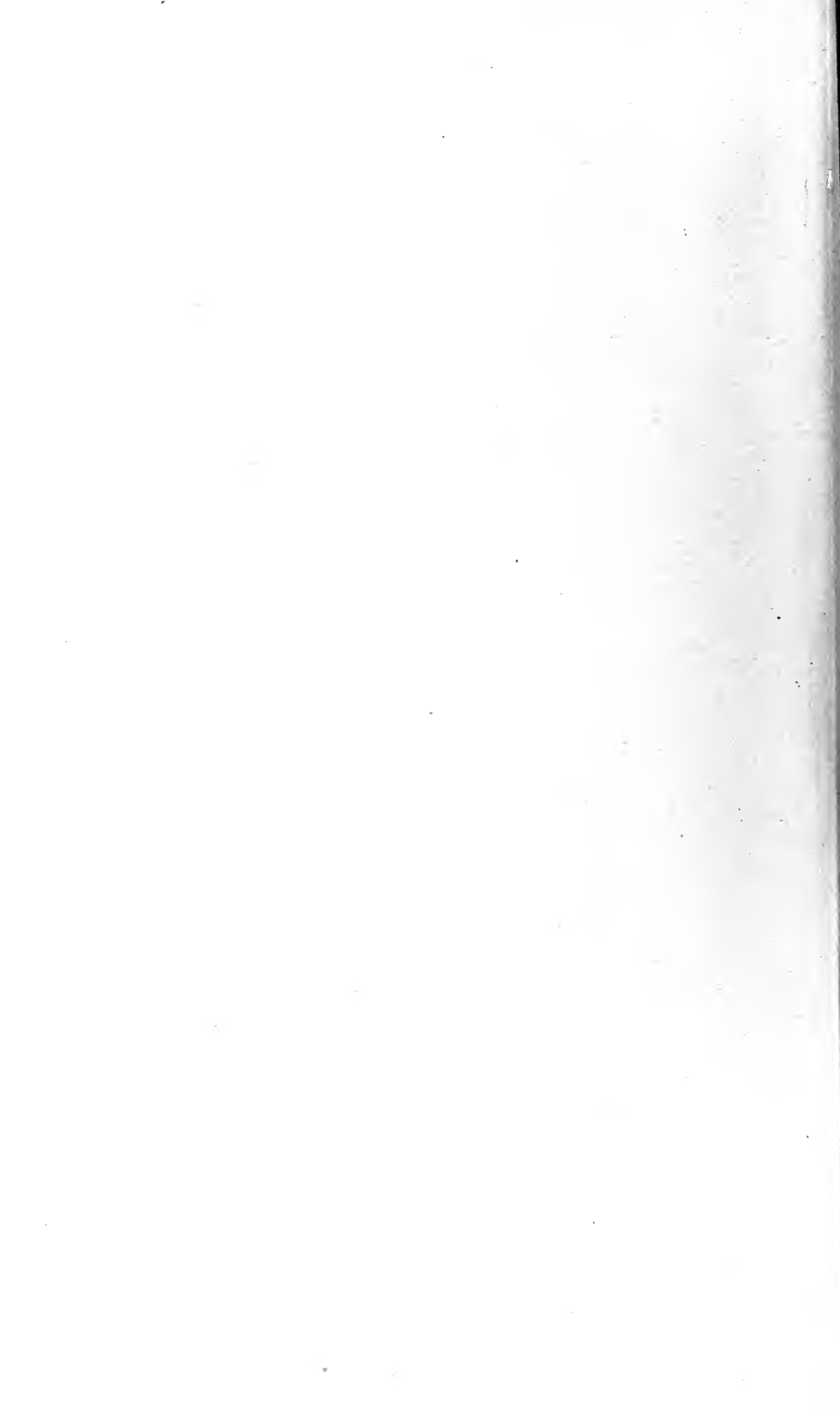
Feigned eruptions occur in all degrees of dermatitis from a simple erythema of a few days' duration to the various vesicular, bullous, gangrenous, and ulcerating lesions. The mild and superficial forms are the more common but superficial gangrene and ulcers are not infrequently seen. The degree and severity of the process depend not only upon the agent employed but also upon the strength of the solution, the duration of the application, and the susceptibility of the tissues to which the agent is applied. Thus a moderately weak solution of carbolic acid, if applied for a few minutes only, will produce in most individuals, an erythema or superficial dermatitis of a few days' duration. If the solution be stronger, or if a weaker solution be allowed to remain in contact with the skin longer, severer forms of inflammation and even gangrene may result.

The methods employed in the production of these lesions are varied and often difficult to detect. Many different animal, vegetable, and mineral substances have been used for the purpose. Among those most commonly employed may be mentioned carbolic acid, croton oil, Spanish fly, mustard, various acids and caustics, lye, and cresoline; burning with hot water bottles, matches, hot metal; and friction with the finger, pieces of wood, or other rough material.

PLATE IV



Dermatitis Factitia.



Occasionally a skilled malingerer succeeds in imitating more or less closely certain definite cutaneous disorders. Among those so imitated may be named sycosis, favus, alopecia, ringworm, scabies, bromidrosis, hæmidrosis, chromidrosis, erysipelas, abscesses, and syphilis. Patients with an eczema or other cutaneous disorder may aggravate or prolong the same and make the interference very difficult of detection even while under treatment.

Diagnosis.—The diagnosis of feigned eruptions is usually not difficult for one familiar with cutaneous diseases, as the lesions do not correspond with those of any recognized disorder. As a rule the lesions all occur within easy reach of the patient's hands, and are most numerous on the anterior surfaces of the body, on the left arm, fore-arm, and hand; the lower extremities, and right side of the face and neck; that is, all regions easily reached by the right hand. In case of a left handed individual, the regions most accessible to that hand would, of course, show the largest number of lesions. The palms, soles, eye-lids, mouth, nose, ears, scalp, and genitals are usually spared.

The lesions are always sharply outlined and of unusual, often fantastic shapes. They appear suddenly, at irregular intervals, usually one or two at a time, and run a fairly rapid course. When fluid caustic is used it frequently happens that one or more drops run down the skin from one of the lesions, leaving a characteristic streak which is usually lighter in color and shows a less degree of inflammation than the patch from which it depends. When the caustic is applied with a needle or pin, as is frequently the case in gangrenous areas, the border shows an irregular, finely jagged, or serrated (saw-tooth) edge, made by the numerous punctures in the advancing border. When gangrene is present, it is usually very superficial, and separated from the normal skin by a narrow, vivid red line. The fingers, nails, or some article of the clothing are often stained by the agent employed.

Subjective sensations, usually pain and burning, may be greatly exaggerated by the patient, who will then cringe or jump at the slightest touch during the examination and will complain bitterly of the distress caused by the simplest and lightest of dressings. On the other hand, the areas may be largely anæsthetic and some of these individuals like to exhibit their ability to endure pain. Many of the patients enjoy mystifying their medical attendant by predicting from twelve to twenty-four hours in advance the exact areas upon which new lesions will occur, claiming that during this period they experience in these areas a sense of heat and burning and other queer sensations.

Further aids to diagnosis may be found in the general characteristics of the patients. The unusual history of the disorder, the discovery of anæsthetic areas especially of the fauces and conjunctiva, and other evidences of hysteria. Finally, if necessary, a fixed dressing that cannot be removed without detection may be used to clear the diagnosis.

The patients presenting feigned eruptions may be roughly divided into two classes: First, deliberate malingerers, such as criminals, soldiers, sailors, and others desiring to escape punishment or service; servants, nurses, and others desiring to avoid disagreeable duties or surroundings; and paupers or mendicants seeking charity, hospital accommodations, or other assistance. Second, hysterical and neurotic individuals, chiefly women and girls, who inflict these injuries upon themselves for reasons not always definitely recognized. With this class of patients there is frequently a desire, more or less definitely recognized by the patient, to escape from disagreeable duties or surroundings, to gain attention, sympathy, interest, or pity, or to achieve notoriety. The sexual element is not infrequently present. Awakening sexual desire, possibly not definitely recognized, in the developing girl; excessive or abnormal sexual activity; orgasm induced by torturing the skin; and a certain satisfaction experienced through exposing the body for examination, are features recognized in some of these cases. In some instances, the patient, while not recognizing any motive, states that she is subject at times to sudden irresistible impulses to produce these lesions. Such impulses may be the result of "suggestion" or of the "fixed idea." In a large proportion of cases the factitious eruption is preceded by some light wound or abrasion of the skin to which an antiseptic dressing has been applied. The patient is thus provided not only with a source for the suggestion but also with the means for carrying it out. The extent to which hysterical young women will injure themselves is illustrated in two of the author's patients both of whom submitted to amputation of the fingers, and one demanded amputation of the entire hand, for gangrene produced by themselves with carbolic acid.

Treatment.—The chief object to be attained for relief of these patients is to induce them to acknowledge the facts. New lesions then cease to appear, and the management of existing lesions should be in accordance with the rules laid down in the chapter on dermatitis.

X-RAY DERMATITIS.

The symptomatology, etiology, and pathology of *x*-ray dermatitis are considered under Radiotherapy.

Treatment.—A better understanding of the possibilities of the *x*-rays has developed a technique, the careful following of which should prevent severe *x*-ray burns, except in rare instances where it is thought advisable to risk the danger of such a burn for the sake of quickly destroying a rapidly progressing malignant growth. Even the mild forms of *x*-ray dermatitis can usually be avoided by the exercise of proper skill and care.

The simpler forms of dermatitis due to *x*-rays may often be treated successfully with the measures recommended for corresponding phases of eczema and dermatitis due to other external causes. Frequently, however, even a mild dermatitis due to *x*-rays is persis-

tent and exceedingly painful, and not infrequently is aggravated rather than relieved by measures applicable to corresponding grades of dermatitis from other causes. In such cases various applications with or without some local anodyne may be tried. Among those we have found the most useful are the following: The lead and opium wash with or without the addition of a powder, glycerin, or boric acid, as recommended for the treatment of acute eezema; a mixture of equal parts of this lotion and carron oil (made with olive oil);

FIG. 54.



Radio-dermatitis, third degree, upon keratodermia.

compound stearate of zinc powder; a simple ointment containing one or two drachms of orthoform to the ounce. We have found the following paste, recommended by Engman,¹ very satisfactory:

"Boric acid, 12 drachms (48.); zinc oxide, starch, bismuth subnitrate, and oleum olivæ, of each 1 ounce (30.); liquor calcis and lanoline, of each 3 ounces (90.); rose water, 12 drachms (48.). The powder should be well rubbed up in a mortar, the lanoline added; the olive oil and liquor calcis then are mixed and slowly added; when this is mixed thoroughly the rose water is added, and the whole beaten up in the mortar into a light, creamy paste."

The surface should be kept covered with this paste, spread on old linen or several thicknesses of gauze. A sheet of gutta-percha tissue may be placed over the dressing to prevent evaporation, unless this is uncomfortable, as it sometimes is, to the patient.

In deep-seated ulcers, which fortunately are seen but rarely, the treatment is usually surgical, the necrosed tissue having to be removed and the surface covered with skin-grafts.

¹ B. J. D., 1903, xv., p. 390.

PSORIASIS.¹

(Gr., Ψωρά, the itch.)

(LEPRA, ALPHOS, PSORA. Ger., SCHUPPENFLECHTE.)

Psoriasis is a chronic, occasionally acute, inflammatory disease, characterized by reddish-brown flat papules or sharply circumscribed plaques or areas of varying size covered with silvery-white imbricated scales.

In surveying the enormous mass of literature accumulated on the subject of psoriasis, it is of the utmost importance, from the point of view of clarity, that the pure types of the disease should be dissociated from others; and especially that the large list of complications and anomalies of dermatoses described as "psoriasis" should not be confounded with the classical and well recognized picture of the affection. Between three and six per cent. of all diseases of the skin are represented under the title psoriasis. It is clear, therefore, that the disease must occur among all sorts and conditions of men and women, that it often develops in persons suffering from other diseases and even from other dermatoses; and that the accidental features of any one case should not be regarded as characteristics of the essential malady.

Symptoms.—In typical evolution the papules and plaques of psoriasis always are defined sharply from the surrounding skin, somewhat infiltrated, slightly elevated, and covered more or less completely with silvery-white or mother-of-pearl colored scales which are arranged in thin layers like mica. On removal of the scales there is exposed in recent lesions a bright-red surface; in older lesions the color is of a duller hue. If the deepest scale, which often is thin, translucent, and closely adherent, is pulled or scraped off, there can be seen several minute bleeding points which correspond to the apices of papillæ beneath. The lesions vary greatly in number, size, shape, and distribution, but the type, that of the dry papule or plaque covered with scales, remains always the same, so that in uncomplicated cases psoriasis is distinctly a dry disease without vesicles, pustules, or other moist lesions.

The primary lesion of psoriasis is a pin-point- or pin-head-sized flat, round or oval, sharply defined, slightly elevated red papule, which always at the earliest moment of observation is covered either entirely, or all but a narrow rim at the border, with delicate silvery-white or mica-like scales. The bleeding points produced by forcibly removing the scales may be so minute that they are only visible with the aid of a lens. As the lesion grows peripherally, it may become somewhat more infiltrated, slightly more elevated, and covered with more abundant imbricated scales, but otherwise it retains its original characteristics. Larger plaques and areas all are formed either by the gradual increase in size of the original papules, or by the coales-

¹ For complete bibliography, see Grosz, Mraček's Handbuch, Bd. ii., pp. 126-168.

cence of a number of papules or smaller plaques. The papules and small plaques formed by the peripheral growth of single papules are usually round or oval, but areas formed by the coalescence of smaller plaques are irregular in outline. In the borders of such patches traces of the original lesions can usually be detected. As a matter of convenience, descriptive terms have been applied to the lesions of psoriasis to denote their size and arrangement.

When the disease appears in the form of small scale-covered points, it is called *psoriasis punctata*. Should the disease progress to fuller development, patches of larger size form, always with a

FIG. 55.



Psoriasis, generalized and in large plaques.

definite contour, very slightly elevated above the general level of the integument, and covered with whitish, mother-of-pearl colored scales in abundance. When the lesions approximate the size of drops of water, the disease is termed *psoriasis guttata*. In more advanced conditions of the disease other names are employed. Thus *psoriasis nummularis* or *discoidea* is characterized by small-coin-sized patches; *psoriasis circinata* or *orbicularis*, by patches in which the disease is exhibited actively at the periphery of a circle, the centre of which is free from disease, a condition due usually to the involution of the centre of an area as it extends peripherally; *psoriasis gyrata* and *figurata*, by coalescence and extension of several patches, forming thus fantastic figures; and *psoriasis diffusa*, by much more extended and uniform involvement of the skin in large areas. In *psoriasis follicularis* the coil-glands and hair-follicles are invaded chiefly.

Areas of long persistence in which the skin is infiltrated deeply, often fissured, and covered with heavy scales, are designated frequently as *psoriasis inveterata*. In a given case the lesions may be of

fairly uniform size, but more commonly, if at all numerous, they exhibit different stages of development and therefore vary in size. They may be arrested at any stage of growth and persist for months or years as guttate, nummular, or larger plaques, or by continued extension and coalescence form areas covering an entire region of the body. Though cases are reported in which the surface of the entire body is covered, it is rare that areas of normal skin cannot be detected.

In number and distribution of its lesions, and in its course, psoriasis varies greatly. The disease commonly begins with one or two

FIG. 56.



Psoriasis (large plaques).

small papules which increase slowly in size. In ordinary cases new lesions appear during the course of weeks, months, or years, until there are from ten to one hundred or more patches of varying size scattered over the body. It is not unusual, however, for the disease to remain for years limited to two or three coin-sized areas, situated commonly over the elbows and knees. Occasionally a single patch may persist indefinitely without the appearance of others. In other instances, but chiefly in recurrences of the disease, a large number of punctate papules may appear within a few days. In the same individual, the number, size, and distribution of the patches vary from time to time. With many patients the psoriatic areas partially or wholly disappear in summer, only to return in cold weather. In a smaller number of cases the disease is worse in summer, and better, or entirely absent in winter. Without the influence of climate or of any other known cause, the disease may disappear partially or wholly for months or years and then return. In recurrences of the disease the lesions do not necessarily correspond in number, size, or distribution with those of earlier attacks. In acute febrile and other intercurrent diseases patches of psoriasis may fade or disappear temporarily.

Involution of a patch of psoriasis begins in the centre, and is recognized by a diminution in the hyperæmia and of the scaling. The process progresses slowly until no trace of the disorder is left.

Temporary pigmentation may remain for weeks, on the lower extremities for months, after the scaling and infiltration have disappeared completely. Should the areas spread peripherally while healing in the centre, circular and oval bands are formed. By the union of a number of such bands are produced circinate and gyrate figures or festoons which may occupy the entire surface of the back or other region of the body.

In distribution, psoriasis is, as a rule, symmetrical, but exceptions to the rule occur. The sites of preference of the disease are the extensor surfaces of the extremities, especially about the elbow and the knee, in which situation it is decidedly most common. After these locations should be named, in order, the scalp, the region of the sacrum (on which often the largest patch upon the body can be discovered), the upper surface of the chest, the face, the belly, and the genitals, more rarely the hands and the feet.

Upon the scalp, plaques of well-defined contour, covered with thick whitish scales, may mat the hairs, but alopecia rarely results. The dry condition of these scales contrasts with the greasiness of the crusts formed in seborrhœa of the scalp. Often a fillet or band of diseased tissue, one or more inches in width, projects beyond the border-line of the scalp and forehead. When the vertex is bald from physiological loss of hair the patch of psoriasis usually lingers near the fringe of the hairs left at the sides of the head, projecting thence to the regions of baldness. On the face, as well as over the genitals, the lesions are usually both indistinct and small-sized, being displayed, as regards the former locality, over the cheeks, chin, and nose, avoiding the parts near the mucous orifices. On the scrotum psoriasis frequently is complicated by fissures, moisture, and other evidences of acute inflammation.

The hands, feet, fingers, and toes are not often involved, and the palms and soles only so rarely invaded as to throw doubt upon a diagnosis based upon the existence of the disease solely in these regions. We have had two cases in which the disease was limited to the palm for considerable periods of time, but later appeared in characteristic forms on other parts of the body. Other writers report similar instances. In severe cases the nails are attacked secondarily, being thickened, eroded in points, irregularly laminated, rigid, and becoming brittle and yellowish-white or dirty-whitish in color. In some cases, however, the nails are primarily if not exclusively attacked. (Cf. the chapter on Diseases of the Nails.) On the palms and soles the lesions may show, instead of scaling, sharply circumscribed areas in which the horny layer is much thickened. Occasionally bullous lesions develop in these regions.¹ Through cracking and partial destruction of horny masses the patches may assume a worm-eaten appearance.

Psoriasis is not known to affect the mucous surfaces. The lesions of so-called "*psoriasis linguæ*" are those of "*leukoplakia buccalis*,"

¹ Psoriasis palmaire avec soulèvements d'apparence bulleuse, MM. Hallopeau et P. Salmon. Bulletin de La Société Fran., 1908, p. 243.

or "smokers' patches," of syphilitic disease of the mouth, or flat epitheliomata.¹ Schütz² reports two cases and refers to others, in which psoriasis was associated with mucous membrane lesions. These lesions, however, occur with other cutaneous and systemic disorders, and their relation to psoriasis is not demonstrable.

In a patient subject to psoriasis a local irritation, such as a pin-scratch, a mustard plaster, may cause new lesions to appear at the site of irritation. Crocker³ describes a form of psoriasis punctata in which the lesions, though numerous, are limited to the sweat-ducts, and another form of punctate psoriasis in which the papules are situated about the hair-follicles.

The amount of scaling varies greatly in different persons and in the same individual; ordinarily the scales are abundant and thickly heaped up over even small areas; sometimes they are sparse over large areas. Free perspiration, friction by the clothing, or frequent bathing may prevent the accumulation of scales on areas where they would otherwise be abundant. Where the epidermis is thin the scaling is less; therefore, over flexor surfaces, near the mucous orifices, and on the back of the hands, the scaling is less than over extensor surfaces, in regions remote from the mucous orifices, and on the palms and soles. The scaling is also less in youth than in advanced years. The scales may adhere with considerable firmness to the patch, or may be shed freely from the surface, in pronounced cases powdering the clothing of the patient or the sheets of the bed upon which he reposes at night.

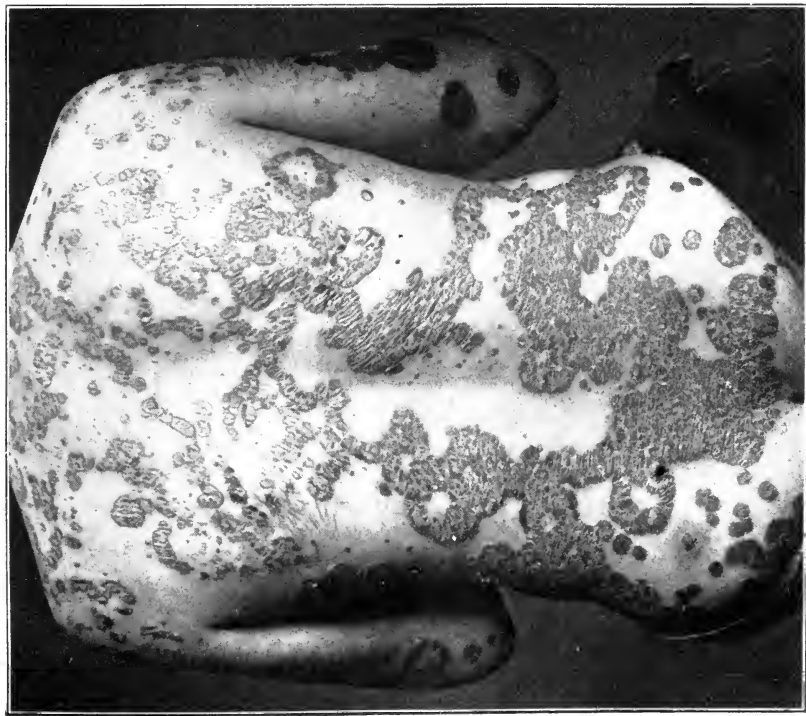
Instead of a lustrous white, the scales may display a deep-yellowish shade, and, instead of being imbricated, may form a thin continuous sheet of exfoliated epidermis. When the eruption is disappearing the scales fall, leaving a pigmented or slightly discolored patch of integument.

Psoriasis is essentially a chronic disease, but may present at times acute exacerbation, and occasionally begins as an acute process. In the acute stages the inflammatory symptoms are more marked; the lesions are of a brighter red color and not so sharply defined as in the ordinary forms of the disease; the scales are also few in number, thin and easily detached, and the sensations of burning and itching may be severe. When acute, the papules are usually numerous and punctate, and may appear on the face; in other instances the patches may be as large as a small saucer; are dark or lurid red over the whole; are covered with a more uniformly constituted, thin, squamous film or sheet of semitransparent delicate membrane through which the red glare of the patch beneath is visible. This condition may be seen also in young persons to whom arsenic has been administered for the relief of the disease, with the production of irritative effects.

¹ An emphatic corroboration of this dictum is given in the discussion of a case reported by Seo (*Annales*, 1903, iv., 219); see also Oppenheim, *Annales*, 1905, s. iv., vi., 379.

² *Archiv*, 1899, xlv., p. 433.

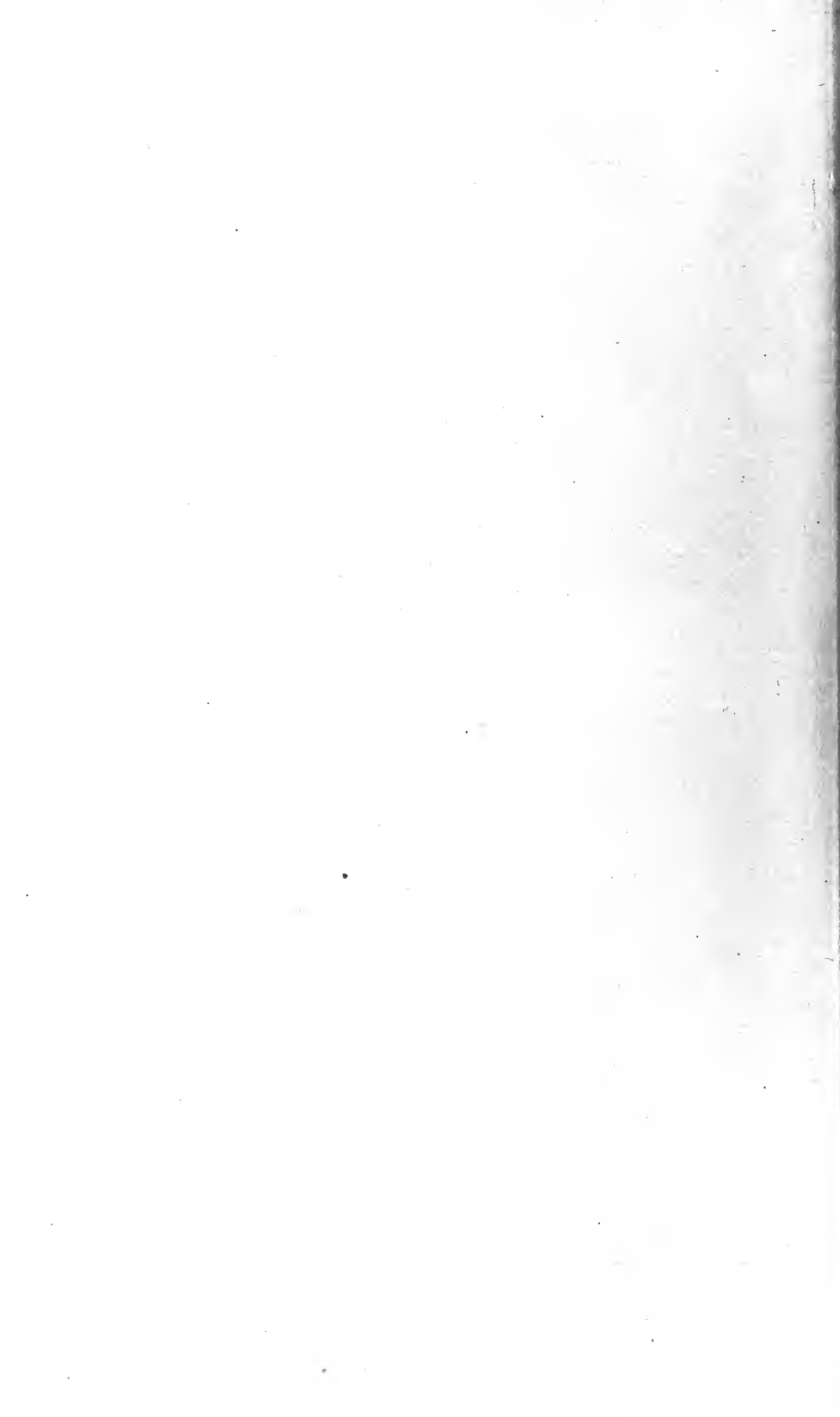
³ *Diseases of the Skin*, 3d ed., p. 361, and *Atlas*, plates 25 and 26.



Generalized Psoriasis. Lesions Coalescing in Places to Form Large Plaques.



Generalized Psoriasis. Guttate and Nummular Lesions.



An acute attack may come and go as such, but usually it terminates in a chronic form of the disease.

Subjective sensations may be entirely absent in psoriasis, even when it is extensive. There is, however, usually slight and occasionally severe itching. In acute cases burning and smarting are often present. In exceptional cases the subjective sensations interfere with sleep and rest; otherwise the disease does not affect the general health of the patient.

Atypical and complicated forms of psoriasis¹ occur in which the character of the lesions is modified considerably. Rarely the scales may be heaped up in the centre in the form of an oyster-shell, producing what is termed *psoriasis rupioides* or *psoriasis ostreacea*. In a few instances the accumulated scales have assumed the appearance of a cutaneous horn.² Hypertrophy of papillæ may produce wart-like lesions, designated as *psoriasis verrucosa* (Besnier, Kaposi, Crocker). The scales may be slightly greasy and the surface beneath exhibit a trace of moisture, making the diagnosis between psoriasis and dermatitis seborrhoïca difficult if not impossible; indeed the two conditions may be associated. Occasionally, in moist situations, on the sensitive skins of children, or as an effect of local irritation or infection, the patches may be inflamed acutely and indistinguishable from ordinary eczema.

There can be no question that intermediate forms between eczema and psoriasis occur, in which forms it is difficult to determine whether the two disorders coexist or the one has assumed the features of the other. In these cases there may be itching and infiltration of the skin, with vesicular and other lesions foreign to psoriasis, and a catarrhal discharge.³

Cavafy,⁴ Kusnitsky,⁵ and others report cases in which psoriatic lesions, though numerous, were limited to one side of the body. We have had such a case in which the psoriatic lesions were limited to the site of a linear nævus. Tscherbakore⁶ reports a case of universal psoriasis occurring in a neurotic subject.

The sequelæ of psoriasis are, as a rule, nothing more than a transitory pigmentation, but cases are reported in which involution of the lesions has been followed by superficial scars (Crocker, Hutchinson), keloid formations (Anderson, Purdon, Crocker), persistent deep pigmentation (Crocker), or permanent achromia (Hallopeau,⁷ Rille⁸). In some cases these unusual sequelæ were due undoubtedly to treatment. A few instance have been reported by J. C.

¹ Beyer reviews the subject and attempts a classification of reported cases. *Wien. klin. Wehnschrft.*, 1901, xiv., p. 805.

² Gossman, *Arch.*, 1897, xli., p. 357.

³ The causes of moist forms of psoriasis are considered by Benassi, *Giorn. ital.*, 1901, xxxvi., p. 427 (abstr. in *Monatshefte*, 1901, xxxiii., p. 460).

⁴ Cited by Crocker.

⁵ *Archiv*, 1897, xxxviii., p. 405.

⁶ *Monatshefte*, xlv., p. 438.

⁷ *Annales*, 1898, s. iil., ix., p. 690.

⁸ *Ibid.*, 1901, s. iv., ii., p. 80 (report of ten cases; discussion).

White,¹ Hartzell,² and others, in which epithelioma has followed verrucous lesions which developed upon psoriatic patches. Some, possibly all, of such changes were due, as suggested by Hartzell, to previous long-continued use of arsenic for the psoriasis. When extensive, and especially after persisting for a number of years without amelioration, psoriasis may lose its distinguishing features and assume all the characteristics, both clinical and pathological, of dermatitis exfoliativa.

Etiology.—The causes of psoriasis are not known. Sex, social condition, and occupation evidently play little or no part in the etiology. The disease is common, comprising nearly 4 per cent. of all cutaneous affections reported in America. The disorder occurs most frequently in the second and third decades of life, but no age is exempt. It is unusual for the first attack to appear after forty-five, and the disease is uncommon under ten and rare under three years of age. Rille³ reported a case in which the disease appeared in an infant six days old. Other cases in infants less than one year old have been reported by Neumann, Kaposi, and others. Benassi⁴ reports fourteen cases between the ages of sixteen months and ten years. Heredity is seemingly a factor in a considerable number of cases, in so far as inherited predisposition or susceptibility to psoriasis is concerned; but direct transmission of the disease itself by inheritance has not been demonstrated. A family history of psoriasis is the exception rather than the rule. Several careful observers, however, have believed that the disease often is hereditary. It is of great rarity in the dark skinned races. Hubbard and others⁵ report a few cases in negroes.

The disease apparently bears no definite relation to any one systemic condition. It appears in individuals who are apparently in perfect health as well as in the delicate and in those ill of other disorders. Defective assimilation and elimination, such as exist in gout, rheumatism, and other arthritic disorders, as well as in plethoric and overfed individuals, certainly exercise an unfavorable influence on psoriasis. Nagelschmidt⁶ has striven to indicate a relation between psoriasis and pancreatic disease. Psoriasis occurring in cases of arthropathy is reported by Mentzer and Adrian.⁷ Associated with such conditions psoriasis is usually indolent in type but exceedingly persistent, unless the systemic condition be improved. In the neurotic and poorly nourished, psoriasis is also persistent, but usually with more acute symptoms. The disease has been attributed

¹ Amer. Jour. Med. Sci., 1885, lxxxix., p. 163.

² Ibid., 1899, cxviii., p. 265.

³ Jour. mal. cutan., 1890, xi., p. 385. In Tenier's case the child was six months of age. Archiv, 1907, lxxviii., p. 445.

⁴ Giorn. ital., 1903, xxxviii., p. 99 (abstr. in Monatshefte, 1903, xxxvi., p. 674).

⁵ J. C. D., 1908, xxvi., p. 321.

⁶ Derm. Zeitschf., 1908, xv., p. 524.

⁷ Jacob Menzen, Über Gelenkerkrankungen bei, Archiv, 1904, lxx., pp. 239–262; Cutan., 1905, xxiii., p. 374. C. Adrian, Über Arthropathia psoriatica, Mitteil. aus den Grenzgebieten der Med. u. Chir., Bd. xl., Heft 2; Archiv, 1904, lxxii., p. 136.

to fright, shock, and other neurotic conditions.¹ Acute toxæmias of various origins have been followed by an outbreak of psoriasis in individuals predisposed to the disease. Brocq and Ayrique² in a careful study of the urine of psoriatic subjects found no constant results.

The possible contagiousness of psoriasis is suggested by the clinical histories of a few cases. The absurd conclusions reached in some of these cases is well illustrated by Méneau where the disease is reported to have been induced by the use of a comb in common. Many attempts to transmit the disease by direct inoculation have failed, but Destot³ apparently succeeded in inoculating himself from an infant with vaccinal psoriasis, and Lassar⁴ succeeded in producing a disease of the skin in rabbits by rubbing into various portions of their bodies scales, blood, and lymph removed from psoriatic patches of a male patient. The disease thus induced is said to be capable of transmission to other animals. Campana,⁵ Tommasoli, and other Italian observers have repeated these experiments, with the result of reaching the conclusion that psoriasis is produced by a parasite as yet unrecognized.

The fact that psoriasis frequently has followed vaccination,⁶ tattooing,⁷ and other local injuries of the skin, has been held by some to be an argument in favor of the parasitic origin of the disease. It has long been known, however, that in psoriatic subjects lesions may be developed artificially in the lines of mechanical irritation. In this way, figures in the shape of anchors, crosses, hearts, etc., have been produced on the skin of psoriatic patients, one of whom has been ingeniously photographed by Fox, of New York.⁸

Gowers reports the artificial production of psoriasis by the internal administration of sodium bichlorate. (Consult the section on Dermatitis Medicamentosa.) Further evidence would be required to prove that these results differed to any appreciable extent from those recognized in any squamous dermatitis produced by an ingested drug.

The distribution of psoriatic lesions suggests that the disease may be due largely to exclusion of sunlight from those portions of the body covered with the clothing and the hair. Certain it is that in exceptional cases only are the hands involved or is the face attacked at a distance from the line of the hairs upon the brow and bearded region (sides of the nose, cheeks, temples). It is likewise true that after exposure of affected areas to abundant sunlight, not only when

¹ Cf. Balzer, *Annales*, 1902, s. iv., iii., p. 639; Audry, *Jour. Mal. cutan.*, 1900, xii., p. 345; and Weidenfeld, *Archiv*, 1903, lxiv., p. 359.

² *Annales*, 1906, 7, 5, 434-460.

³ Review of the case by Hallopeau, with discussion, *Annales*, 1901, s. iv., ii., p. 337.

⁴ *Deutsche med. Zeitg.*, 1885, No. 93.

⁵ *Clin. Dermosif.*, p. 1, 1906; *B. J. of D.*, 1906, 18, 337.

⁶ Weinstein; *Brit. Med. Jour.*, 1902, i., p. 271 (*résumé* of twenty-four cases).

Also Richlane. *Monats.*, 1896, xxii., Feb.

⁷ Bettmann, *Münch. med. Wehnschrft.*, 1901, xlv., p. 1597.

⁸ *Photographic Illustrations of Cutaneous Diseases*, New York.

patients are treated intentionally by such exposures of the nude body to light in hospitals and in private practice, but in occupations which necessitate the same, beneficial results often are marked.

The author¹ has elsewhere called attention, to the strong probability that a species of light-hunger, affecting the habitually covered skin of man, is responsible for psoriatic lesions. The fact that the lower animals never exhibit the symptoms of the disease; that it is most prevalent in those countries and at those seasons of the year when sunlight is least abundant; and that the regions of the body specially attacked are those habitually either screened from the light, or exposed to it only irregularly and at intervals—these all point to the possibilities of operation of a cause set aside when radiotherapy or heliotherapy has been skillfully employed.

In winter and in cold countries psoriasis is much more prevalent than in warmer seasons and climates. Kayser,² reports that in the tropics the subjects of psoriasis are few and the symptoms of the disease when they develop at all are "rudimentary," the typical eruption being scarcely ever produced. Finally in a considerable number of individuals, displaying through life unchanging patches in which the characteristic symptoms are the same year after year, the ailment would seem more properly to be classed with the deformities than with the diseases of the skin.

Pathology.—The pathogenesis and the proper interpretation of the histopathological changes in psoriasis are unsettled problems. Many cases suggest a trophoneurotic or vasomotor origin; others appear to be toxic and dependent on systemic conditions. The theory that seems to be most attractive to investigators is that the disease is due to some as yet undiscovered parasite, implanted on susceptible soil.

Lang³ described a fungus which he named "epidermophyton," and which he believed to be the cause of psoriasis. His findings once confirmed by Wolff and Eklund⁴ are practically rejected by Neisser and others. Campa⁵ recognized, with the Giemsa stain, round or oval bodies, with finely granular protoplasm, in the deeper epidermis which resembled the Donovan-Leishman bodies. Weyl, who believes that psoriasis is due to an inherited weakness of the nerve-centres, regards Lang's "brood cells," as myelin-like exudations. Ries⁶ and others found the bodies described by Lang to be artificial products, not spores. It is possible that these bodies are the same as those which Crocker describes as "minute circular bodies which lie in loose clusters between the separate layers," and which by the aid of modern technique, Munro,⁷ Kopytowski,⁸ and others have

¹ Brit. Med. Jour., 1906, Oct. 6, p. 833.

² *Geneeskundig Tijdschrift voor Nederlandsch-Indie*, 1907, xlvii., fasc. 5.

³ *Vierteljahr.*, 1878, xv., p. 346.

⁴ *Annales*, 1885.

⁵ *Clin. Dermosif.*, 1905, 2 plates, B. J. D., 1905, xvii., p. 346.

⁶ *Vierteljahr.*, 1888, xv., pp. 521, 685, 871 (review of previous reports on pathology of psoriasis, with bibliography).

⁷ *Annales*, 1898, s. iii., ix., p. 961.

⁸ *Ibid.*, 1899, s. iii., x., p. 705.

shown to be leukocytes situated between the lamellæ of the psoriatic scales.¹ The two last-named observers state that accumulations of leukocytes which they call "dry abscesses" exist between the outermost cells of the horny layer, before the appearance of other changes in the epidermis or corium. They look upon this fact as almost conclusive evidence of the parasitic origin of the disease, but were unable to demonstrate the parasite. Robinson,² who studied lesions in all stages of development, Thin, Jamieson, Tilbury Fox, and others believe the process begins with hyperplasia of the rete which is followed by inflammatory changes in the corium. Other investigators of the earliest lesions, including Crocker and Verotti,³ believe that the pathological process begins as a circulatory disturbance in the corium, and that the epithelial changes are secondary.

The histopathology of the disease has been studied by many observers, including Hebra, Kaposi, Bosellini, Jarisch, and Schütz. The corium, especially in the papillary and subpapillary portions, shows evidence of subacute or chronic inflammation. There are vascular dilatation, moderate œdema, and infiltration of polymorphonuclear and small round cells, which is most marked about the vessels. The papillæ are much elongated by the pressure from the interpapillary prolongations of the rete. The rete shows a marked hyperplasia, especially of the interpapillary processes, the number of cells immediately over the papillæ, however, being fewer rather than in excess of the normal, a fact which accounts for the readiness with which the papillæ bleed on removal of the scales. There is some intercellular œdema, the transitional layers are partially or wholly absent, and the process of cornification is incomplete, the outer cells retaining their nuclei. Bonnet⁴ has recently recognized changes in the stratum corneum of the epidermis.

The accumulation of leukocytes between the lamellæ has already been mentioned. The presence of air between the cells forming the scales gives the latter their peculiar silvery-white appearance.

Diagnosis.—The recognition of a pronounced case of psoriasis is made with ease, and often by those unskilled in cutaneous disease. As usual, it is the atypical form of the eruption that awakens doubt. The diagnostic features of the common types are summarized in the first paragraph under the heading of Symptoms.

Eczema.—Eczema and psoriasis differ in a striking manner with respect to their sites of predilection and their extension from such sites in progressive cases. Eczema, from the head to the toes, elects the anterior surface of the body, the neighborhood of the mucous outlets, the flexor faces of the joints and limbs, the crevices, folds, pockets, depressions, and protected angles of the skin. Psoriasis elects the posterior surfaces of the body, avoids the vicinity of the

¹ Sabouraud states that the scales of many superficial inflammations show leukocytes and coagulated serum between the lamellæ (*J. C. D.*, 1903, xxi., p. 61).

² *N. Y. Med. Jour.*, 1878.

³ *Annales*, 1903, s. iv., iv., p. 633 (bibliography of recent literature).

⁴ *Lyon méd.*, 1907, fév. 24, p. 350, *Annales*, 1907, s. iv., viii., p. 704.

mucous outlets, spreads abundantly over the extensor aspect of the joints and extremities, and enjoys the regions of pressure and friction, as the skin over the patella and the olecranon process of the ulna. Psoriasis, covering the vertex and scalp, lingers at the brow, where its scaly thatch stretches from side to side close to the line of the hairs, and creeps more indistinctly down the face on either side in front of the ear, reluctant to spread over the cheeks, nose, and lips. Eczema easily escapes from the scalp to the nose, lips, or chin, or lurks in the folds of the pinna of the ear. Psoriasis will cover the back and reach forward in front by almost symmetrically disposed parallels in the direction of the ribs, while eczema sweeps between and beneath the breasts or around the nipple. Psoriasis usually spares the hands and the feet, which eczema punishes.

In individual patches eczema will be recognized by its severe itching; by the scratching it excites; by the history of moisture, discharge, and crusting; by its ill-defined outline; by its asymmetrical disposition, except upon the similarly irritated hands and feet; and by the fewer, more yellowish, smaller, and less lustrous scales which characterize its squamous varieties. In squamous eczema, moreover, the areas are as a rule larger, more irregular in shape, fewer in number, and the less perfectly defined outline does not show the small round plaques which unite to form the larger psoriatic areas.

Seborrhœa.—This disease could only be confounded with psoriasis of the scalp; but the last-named affection is, in the vast majority of cases, exhibited also in patches upon other portions of the body on which seborrhœa is never seen. Seborrhœa of the scalp also occurs in usually diffuse forms, the surface beneath the crusts being rather anæmic and pallid in appearance, not bleeding readily, as in psoriasis. The crusts, too, in seborrhœa, are distinctly fatty and greasy when rolled between the fingers, and have a dirty-yellowish hue, rarely recognized in the whitish scales of psoriasis. In psoriasis the hairs are not progressively loosened and gradually thinned as in seborrhœa. Lastly, seborrhœa may fringe the line of the hairs at the brow, and even form a band an inch or more in width, but the advancing border does not show the outlines of the small lesions of psoriasis. In seborrhœic dermatitis the scales are smaller, greasy, and less abundant. The surface beneath is moist or oily, shows no bleeding points, and is less reddened than in psoriasis. The lesions are most numerous on the scalp, over the sternum, and between the scapulæ, and rarely are found on the elbows and knees.

Syphilis.—Psoriasis in many cases greatly resembles the squamous and papulo-squamous syphilides. The necessity for a clear recognition of either disease occurring in suggestive patches is often of the highest importance.

In syphilis the greatest aid will be obtained by a history in both sexes, of infection, adenopathy, and mucous patches; and in women of abortions, miscarriages, or stillbirths. Psoriasis is a singularly uniform disease; syphilis is decidedly multiform in its manifesta-

tions. Syphilitic patches are less symmetrical, more elevated at the edge, and the scales with which they are covered are fewer, smaller, and dirty-whitish rather than lustrous in color. Their circular outline is often abruptly broken by gaps, with the result of producing semilunar and small arc-shaped segments. In syphilis the eruption is less generalized, and shares with other syphilodermata the brownish and purplish hues of the skin beneath, lacking the vivid redness and pinkish red of many non-syphilitic lesions. The scales of many of the syphilides which resemble psoriasis partake of the character of crusts, being agglutinated by pathological exudations from the patch; they are rarely so exclusively squamous as in psoriasis. In syphilis the tendency of the patch is to exhibit an affected surface somewhat beyond the line of the scales; in psoriasis the scales more frequently reach beyond the border of the affected epidermis beneath. The squamous syphiloderm of the palms and soles often occurs only in these localities. Psoriasis is extremely rare in such situations, and is seldom limited to these regions exclusively. A psoriasiform circlet limited to the region of the mouth, nose, or chin will generally prove to be syphilitic. The disease which has for a long time persisted in the production of squamous patches can generally be demonstrated to be psoriasis, as syphilis changes its type in the course of months.

Pityriasis Rosea.—In this disease the patches are more oval than circular, the scales much finer, and on their removal no bleeding points are seen. The centre of the patch is usually tawny or salmon colored. The disease is much more superficial, less inflammatory, and much more rapid in its career than psoriasis. Complete involution is accomplished usually in a few weeks and recurrences are rare.

Lichen Planus.—The primary lesions in lichen planus are very minute, flat, angular papules which as individuals rarely become as large as the cross-section of a small pea. The larger areas are formed always by grouping and coalescence of small papules. Instead of presenting distinct scales, the lichen planus papule is covered with a thin horny layer giving the papule a glazed or varnished appearance. There is a tendency to linear arrangement of the lesions, and when these coalesce to form larger areas the latter are commonly linear or angular in outline. The larger papules and patches in lichen planus have a characteristic purplish or violaceous hue, which never is seen perfectly in psoriasis. The favorite sites of lichen planus are the flexor surfaces of the wrist and forearm, and the leg above the ankle. It is rarely conspicuous on the elbows, knees, and other regions commonly affected by psoriasis.

Pityriasis rubra pilaris (lichen ruber acuminatus) is a comparatively rare disorder and has for primary lesions fine, pointed, scale-capped papules which do not enlarge peripherally, but form larger areas solely by the coalescence of many small papules, some of which can be demonstrated at the borders of the larger areas. The characteristic circular areas and the typical scales of psoriasis are wanting, and there is frequently some impairment of the general health.

In exceptional instances, however, the two disorders may progress to the formation of a generalized or universal exfoliative dermatitis, in which it would be impossible from clinical or histological examination to state in which of the two disorders the final condition originated.

Lupus Erythematosus.—In the rare cases in which psoriasis appears on the face without characteristic lesions elsewhere, the picture might suggest an atypical lupus erythematosus with scattered lesions. The scales of lupus erythematosus, however, are scanty, firmly adherent, yellowish, and attached to the orifices of the sebaceous follicles. There is also a bluish and violaceous tint to the red patch of lupus erythematosus, and lesions which have undergone involution may leave the characteristic atrophic or stippled scars.

Tinea Circinata.—In ringworm of the body there are as a rule in northern climates fewer patches, and these are more distinctly circular. They rarely attain a diameter of two inches without showing a clearing centre and a slightly elevated border covered with furfuraceous scales. The discovery of the fungus will establish the diagnosis.

Favus of the scalp might be mistaken for psoriasis of the same region, but the occurrence of sulphur-colored, cup-shaped crusts, the existence of the parasite, the lustreless and brittle condition of the hairs, the presence of irregular areas of alopecia or of reddened scar-tissue, and a possible history of contagion will insure identification of favus. In psoriasis, too, the hairs usually are attached firmly in their follicles, while they are loosened in favus.

Treatment.—Though it is unusual to see cases in which psoriatic lesions cannot be removed temporarily, the disease often returns, and is exceedingly resistant to treatment. A method which is successful in a given case may fail in the next; indeed, a method which gives prompt relief in a given case at one time may fail utterly in subsequent attacks of apparently the same nature. The involution of the disease under treatment is, as a rule, not rapid, and a chosen method should not be abandoned until it has been given a thorough trial.

Systemic Treatment.—The general condition of each patient must be ascertained and given due consideration in the treatment. There are many cases of psoriasis in which treatment will prove unsuccessful until an accompanying systemic disturbance is recognized and given proper attention. On the other hand, when the health, habits, and surroundings of the patient are normal, it is better to give local treatment a thorough trial before resorting to arsenic and other drugs which are supposed to have a specific action.

When, as in the anæmic, the debilitated, the neurotic, the gouty, or the rheumatic, a systemic disorder is demonstrated, the indications for treatment are clear. The doubtful cases are those in which, after careful study, no definite systemic disturbance is discoverable. Psoriasis occurs not infrequently, and is often especially persistent in individuals who may be classed as fleshy, plethoric, or overfed,

without other evidences of ill-health. In such cases a restricted diet, increased elimination, with possibly the administration of an alkali, are effective aids to local treatment. Some writers advocate such measures in all cases unless they are contraindicated by anæmia or other conditions calling for increased nutrition of the body.

The diet should be simple and nutritious. In most instances meat, sweets, pastry, hot breads and hot cakes, and highly seasoned foods should largely or wholly be avoided. Vegetables and fruit may be eaten freely. In acute conditions, when the subjective sensations are annoying, the diet should be practically that recommended for acute stages of eczema. Alcohol, coffee, tea, and tobacco should be interdicted or used in moderation only. Passavant, however, claims to have cured himself and others by an exclusive diet of meat.

Among the remedies supposed to have a specific action upon psoriasis, arsenic enjoys the highest rank. In some cases prolonged administration of arsenic gives temporary or even permanent relief; in a large proportion of patients, however, carefully selected as fit subjects for this therapeutic agent, it will prove utterly valueless even in the most skilled hands. Moreover it is not possible to determine in advance what cases will yield to arsenic, and even with a given individual the drug may be of great value at one time and at another without effect. Recognizing these facts, the wisest course is not to employ arsenic at first, but to delay its administration in any case until local treatment has been given a thorough trial.

Arsenic is valuable chiefly in persistent cases in which the lesions have ceased to enlarge. It is unsuited for all cases of psoriasis occurring with rather acute symptoms, such as subjective sensations and unusually vivid redness of the patches. It should not be given when the disease is in process of evolution, and, therefore, not in psoriasis punctata and guttata, unless the lesions have long been limited to patches of the sizes to which these names are given. For the same reasons it is often objectionable in the psoriasis of the young, for though the drug is usually well tolerated in early periods of life, it is, unfortunately, in the young in whom the disease is also most often encountered in its progressive stages.

The following rules for the administration of arsenic are in general to be observed: It should be given with or immediately after the ingestion of food, so that it may be commingled with edible substances in the stomach. It should be given at first in small doses which are to be increased cautiously. The possibility of the production of toxic effects should be remembered, and on their appearance the remedy is to be given in a smaller dose, and not completely discontinued unless such a course be imperative.

Individuals not infrequently possess a marked idiosyncrasy against arsenic. Cases are seen also in which the administration of arsenic for psoriasis is followed by acute exacerbation of the disease with decided aggravation of the subjective symptoms. Even in cases in which arsenic ultimately proves of value, no results may be

achieved for a number of weeks. The value of arsenic, therefore, in a given case cannot be tested with a course of less than three months. The prolonged use of large doses of arsenic has been followed in many instances by palmar and plantar hyperkeratosis, and in a few instances by verrucous growths, some of which have become epitheliomatous.¹ Continued use of arsenic is capable also of producing more or less generalized pigmentation with or without a diffuse hyperkeratosis.

The preparation of arsenic usually employed is Fowler's solution, the exhibition of which should always be begun in doses of from $\frac{1}{2}$ minim (0.033) to 3 minims (0.20), this amount to be contained in a solution of fixed and relatively large dose, such as a teaspoonful of infusion of peppermint, wine of iron, dilute syrup of gentian, of orange-blossoms, or compound tincture of cardamom with water. When only remedial effects are obtained, such as diminution of the scaliness, the dose may steadily be continued without change for long periods of time, and usually with advantage for some time after the symptoms of the disease have disappeared entirely. When, without the production of toxic effects, the eruption seems unaffected by treatment, the arsenic may cautiously, and always under the direction of the physician only, be pushed until 10 or more drops of Fowler's solution are administered at a dose. Other preparations of arsenic may be used. A solution of sodium arsenate is preferred by Stelwagon in cases of weak digestion. Arsenous acid may be given in doses varying from $\frac{1}{40}$ to $\frac{1}{20}$ (0.0016–0.0033) grain in pill or tablet, or in the form of the Asiatic pill, the formula for which is given in the section on General Therapeutics. This pill is less likely to be tolerated well than Fowler's solution, but cases are on record in which a psoriasis which proved rebellious under the administration of other forms of arsenic, yielded to the Asiatic pill.

Sodium cacodylate, an organic compound of arsenic containing 55 per cent. of arsenous acid, has been recommended and used largely by some French dermatologists. It is supposed to disturb digestion less and to be comparatively free from the danger of producing toxic symptoms. The dose recommended is from $\frac{1}{2}$ to 3 grains (0.033–0.2), three times a day. That it is not safe in large doses was demonstrated by the case of Murrell,² who gave a patient 1 grain (0.06), three times a day, until, on the eleventh day, there suddenly appeared serious symptoms of intoxication. Dermatitis following its use is reported by Balzer and Griffin.³ We have used the drug in a few cases in doses varying from $\frac{1}{16}$ to $\frac{1}{2}$ (0.004–0.033) grain, three times a day, but have not found it of greater value than the other preparations of arsenic.

Satisfactory results often follow the internal administration of

¹ Cf. White and Hartzell, loc. cit. The author has had several such accidents brought to his attention.

² *Lancet*, 1900, ii., p. 1923.

³ *Annales*, 1897, s. iii., viii., p. 732.

mercurous iodide in $\frac{1}{3}$ grain (0.013) doses after meals. The remedy is given, not in cases in which a syphilitic taint is suspected (for psoriasis is not a manifestation of syphilis), but as an alterative. It is believed to be effective in consequence of its special effect on the liver. In some patients it seems to have little value. Carbolic acid and nitric acid, the last-named in the largest medicinal doses, are highly extolled by some authors.

Crocker advises the use of sodium salicylate and salicin in all forms of psoriasis, but especially during periods of active development of the disease, when arsenic usually is harmful. I have found these remedies of value in a number of cases. Salicin is the better of the two preparations, as it interferes less with digestion. It may be given in doses ranging from 10 to 20 grains (0.66–1.33), three times a day. Haslund recommends potassium iodide, increased from the smaller to the largest tolerated doses. As many as 600 grains (40.) of the iodide have been administered by this method *per diem*; it is of occasional service. The wine of antimony in 5 to 10 minim doses (0.33–0.66); chrysarobin, $\frac{1}{3}$ grain (0.01) rubbed up with sugar of milk, three times daily; potassium bromide and sodium iodide have also been administered with reported success.

In plethoric or rheumatic patients local treatment often is rendered more effective by the internal administration of alkalies such as liquor potassæ, potassium citrate or acetate, or sodium bicarbonate in doses of from 10 to 30 grains (0.66–2.), taken with large quantities of water three times a day. In the gouty state with excess of urates in the urine Robinson advises:

R Potass. acetat.,	3j;	30	M.
Spts. æther. nit.,	f3ss;	15	
Vin. colchici,	f3ij;	8	
Syr. aurantii,	f3jss;	45	
Sig. A dessertspoonful three times daily in water after meals.			

As to the other remedies employed internally for the relief of the malady, a very fair estimate of their value can be made by remembering that arsenic is superior to them all. Phosphorus, tar, copaiba, oil of turpentine, cantharides, colchicum, and pilocarpine have at times a feeble transitory influence over the patches of the eruption, but their employment will disappoint far more often than satisfy. The treatment of psoriasis by the administration of extract of the thyroid gland practically is abandoned as fruitless of desirable results.

External Treatment.—The influence of climate in inveterate psoriasis should never be ignored. Many patients who suffer from repeated relapses of the disease are worse in winter, and are either better or entirely free from the eruption in summer. In mild climates in which the temperature is uniformly registered at or near a point of maximum comfort for the skin this disease is both infrequent and less severe. Given an equable climate many patients obtain prompt relief at the seashore, while others improve rapidly under the influence of the dry atmosphere of higher altitudes. The major-

ity of patients with psoriasis, however, are unable or unwilling to seek a change of climate for the relief of a disease which at worst is an annoyance. In cold and changeable climates some patients add greatly to their comfort by varying their dress to meet the exigencies of the weather, thus keeping the skin at as even a temperature as possible. When there is much itching, cotton or linen underwear next the skin is imperatively required.

The **local treatment** of psoriasis requires patience, care, and a certain degree of skill. In a large majority of cases a remedy can be found which, when applied with proper care and persistence, will remove the lesions completely. This result, however, does not insure the patient against recurrences of the disease. The first indication to be met is the complete removal of the epidermic scales from the patches; their removal is accomplished in various ways. It is preferable to secure first their maceration in some fatty substance, such as one of the oils, or glycerin, or vaselin, after which the scales may be washed off with the aid of soap and water, the patient being given a general bath if the eruption be extensive. After such bathing a salicylated salve (ten to twenty grains (.66–1.33) of the acid to the ounce (30.) of cold cream salve or Lassar paste may be applied to the patches from which the scales have been removed. If the eruption be localized, these oily or fatty substances may be spread upon pieces of lint or cotton, and thus be retained in contact with the skin by a bandage. The scales may also be removed rapidly with a dermal curette, if they occur in few patches, or if the patches are to be found in totality or in part upon some portion of the body in which the disfigurement demands special attention, as upon the forehead and the cheeks. The squamous masses are also removable with water alone, as after maceration of the skin in a bath, or after a profuse diaphoresis, or even after moderate exudation of sweat, if evaporation of the latter be prevented by covering the affected part with oiled silk or with rubber tissue. Usually there is no difficulty in removing the scales, patients often declaring that they can themselves cleanse the surface. They ask to be shown how to prevent the recurrence of the desquamation.

Exposure of the skin to solar light is of great value in many cases. Domenci,¹ describes the case of a man 20 years of age who had suffered from psoriasis for eighteen months. The patient was improved after twenty minutes exposure to the sun's rays. In one month the scales ceased to form and at the end of the season, he was completely relieved. There was no recurrence for one year. I have found some patients who would free themselves from the disorder by giving the affected parts a sun-bath daily or several times a week.

Baths play an important part in the subsequent treatment of the disease. They may be employed, as by Hebra, so that the patient remains in the water for from four to eight hours in the day; or be medicated by the addition of sulphur, tar, or other substances, so as

¹ Gazz. d. Osped., 1908 (abstr. in Derm. Centralb., 1908, xii, p. 15).

to combine a medicative with a macerative effect. In private practice these baths are much less available than in hospitals. When the eruption is generalized and an excessive macerative effect is desired an undershirt and drawers, made of soft rubber cloth, may be worn by the patient for several hours of the day. The sweating is often profuse, and is debilitating to such an extent that the psoriatic skin will rarely tolerate the treatment for an entire day, or even for that part of the day in which active labor is performed. By this sweating alone it will at times be found possible to secure complete disappearance of the patches.

In other more obstinate cases, or in those in which for any reason vigorous treatment is indicated, as upon the scalp and face, *sapo viridis* may be employed with advantage in the soap-and-water treatment. The *spiritus saponis kalinus*, 2 ounces (60.) of the soap to 1 ounce (30.) of alcohol, may be rubbed briskly over the patches with the aid of a piece of flannel or a sponge, and then immediately be washed off with the oil and scales in a surplus of hot water, or be left for a time in contact with the part. Hebra and Kaposi employed a species of soap-paste, made by rubbing into each patch a small quantity of green soap to which a little water is added until the proper consistency is obtained. These inunctions are repeated twice daily for six days. The epidermis becomes brownish-colored, and in three or four days afterward it exfoliates in lamellæ; then a general bath cleanses the surface. In the French hospitals a somewhat speedier method is pursued. On the evening of the first day the patient is anointed with green soap, which is retained upon the skin during the night. In the morning he takes an alkaline bath, and immediately after is thoroughly anointed with lard. This course is repeated on the second and third days, after which the patient is usually ready for topical medication of the diseased parts.

For the more obstinate cases in which exfoliation of the epidermis is not readily induced more energetic measures have been adopted, such as the local use of salicylic acid in alcohol, 1 drachm (4.) to 4 ounces (120.), caustic acid and alkalies, scrubbing the patches with nail-brushes, floor-brushes, etc., and the use of clean white sand.

Once ready for topical medication, the patches may be subjected to the local action of the remedy selected for the relief of the disease. The choice of a vehicle for the application of remedies is a matter of importance. For hospital patients, moderately soft ointments, such as lanolin or lard, with or without the addition of cold cream ointment, may be rubbed into the patches, which may then be covered with cloths spread with more of the same ointment. For such cases, an ointment which keeps the surface soft and favors penetration of the remedies is usually more rapidly effective than the drier pastes, especially when there is much scaling and infiltration. When the patches are irritated moderately, and in acutely spreading areas, the protection afforded by the paste is often of more value than the closer contact of the remedy with the lesion permitted by the soft ointment.

But the majority of patients with psoriasis are unable to give the time necessary for hospital treatment, and remedies must be chosen which will not interfere with the usual vocation of the individual. For the scalp and other hairy parts, vaselin, or equal parts of vaselin, lanolin, and olive oil, are convenient ointment-bases. For the face and hands a moderately soft ointment may be used as directed above for hospital cases. When the occupation of the patient will permit, the lesions may be kept covered with a thin coating of the same ointment during the day, or this may be removed entirely and the patches protected with a tragacanth-varnish (see section on General Therapeutics), which in turn must be washed off at night before applying the ointment. For covered portions of the body, the most convenient base is a paste, equal parts of vaselin, lanolin, zinc oxide, and talcum making a good combination. When the lesions are few in number, the paste may be spread on a cloth and applied. In more extensive cases the paste may be spread in a thin layer over the patches, which then are covered freely with any simple powder. This is patted on with the hand or with cotton until a dry surface is formed which does not adhere to the clothing. The underclothing next the skin should be of soft cotton.

For circumscribed areas flexible collodion, liquor guttæ perchæ (traumaticin) holding in solution the remedies to be employed, or medicated plasters are more convenient and cleanly than pastes or ointments.

Salicylic acid, in paste, ointment, or plaster, in strengths varying from 2 to 20 per cent., is often effective, and is free from the disagreeable and even dangerous properties of some of the stronger drugs. For the face, scalp, and hands there is no better remedy in the majority of cases than ammoniated mercury in 2 to 20 per cent. ointment or paste. This remedy is cleanly and usually causes the lesions to disappear; but it cannot be used over large areas without danger of absorption and constitutional symptoms.

A drug of great value in the treatment of psoriasis is chrysarobin. This is a crystalline powder of the color of old gold, insoluble in water, but is dissolved readily in hot alcohol, chloroform, benzol, vaselin, and hot fat. It is derived from the "Goa powder" of the East Indies, or the "araroba powder" of Brazil, the employment of which in psoriasis was recommended first in 1878 by Squire, of London. The drug may be applied in strengths varying from 2 to 40 grains (0.13 to 2.66) to the ounce (30.) of ointment, paste, plaster, collodion, or liquid gutta-percha. It is used occasionally in greater strength, but with pure specimens it is liable in larger proportions to produce disagreeable effects, commonly manifested in a hot, itching, swollen, irritable, and erythematous or darkly stained skin, stretching with tolerable uniformity in every direction from the surface of application. Even in the strength named above it is necessary to begin its use with caution, testing it by application first to a limited area of integument. The dermatitis produced by the drug usually subsides in a few days.

When chrysarobin produces its most brilliant effects the psoriatic patch, previously denuded of its scales, assumes a whitish and normal aspect, contrasting thus somewhat remarkably with the chocolate or brownish-black discoloration of the stained skin at the periphery. This discoloration, when produced either by the ointment directly or by a frequent transfer of its ingredients to other parts by the medium of the clothing and the hands, involves also the nails, the hair, and the undergarments of the psoriatic patient. Its employment upon the face and the scalp is thus largely interdicted. The staining of the skin and its appendages disappears in time, but always slowly.

Chrysarobin is of value chiefly in persistent cases in which milder remedies fail. In the acute forms there is great danger of producing dermatitis with the drug. When the lesions are numerous, or in large areas, the most rapid results are obtained by applying the remedy in the form of a soft ointment 20 to 60 grains to the ounce (1.33—4. to 30.) which may be rubbed thoroughly into the patches once or twice a day. The surplus ointment may be wiped off and the skin covered with a dusting-powder. Used in this way the drug stains the underclothing and the skin and is more liable to produce a dermatitis. For circumscribed areas, chrysarobin may be applied in liquor guttæ perchæ (traumaticin). After the scales have been removed thoroughly, a film of traumaticin is applied with a brush or a swab, and allowed to dry. Several coats may thus be put on within a few minutes. The dressing usually will stay in place several days. When it becomes loose, it should be removed and a fresh dressing applied. Instead of traumaticin, collodion may be used. An effective combination, suggested by Fox, is 10 parts each of chrysarobin and salicylic acid, 15 of sulphuric ether, and 100 of flexible collodion. The following method, first suggested by Besnier, brings the drug in closer contact with the lesions and gives more rapid results: a solution of chrysarobin in chloroform, 20–40 grains (1.33—2.66) to the ounce (30.), is applied to the patches. The chloroform rapidly evaporates, leaving the powder adhering to the surface. When a sufficient quantity has thus been applied and is thoroughly dry, collodion or traumaticin is allowed to flow over the patch to produce a protecting film. Instead of dissolving the chrysarobin in chloroform, it may be mixed with water to form a paste and applied in the same manner. Fox uses chrysarobin in a 50 per cent. aqueous solution of ichthyol. After painting it on the patches and allowing it to dry, a dusting-powder may be used.

Hallopeau reports cases in which the lesions disappeared when kept covered with unmedicated traumaticin.

Tar is among the most valuable remedies in the local treatment of psoriasis. It will, however, accomplish the result desired only when so applied that it is tolerated well by the skin. In very young patients, as also in those whose skins are tender and irritable, or those suffering from any of the acute phases of the disease, it may prove

decidedly injurious. The rule should be always to employ it at first tentatively over a relatively small portion of the affected surface, upon which the medicament should remain for several hours, as tar will not in all cases promptly produce its injurious effects. These effects are, subjectively, a sense of heat and pain; and, objectively, heat to the touch, redness, and tumefaction. Often black puncta are visible when the tar is lodged in the orifices of the cutaneous follicles, simulating thus the "black head" of the comedo, a condition termed by Hebra "tar-acne."

Pix liquida, oil of cade, or preferably oleum rusci may be employed in the form of a salve, 1 drachm (4.) of either to the ounce (30.) of lard or other fatty basis (lanolin, vaselin, etc.). A thin stratum of this ointment several times in the day or merely at night may be painted over or well rubbed into a patch denuded of scales. In Vienna a still more energetic effect is secured by using soft soap freely over the patches while the patient is in the bath, then anointing him with tar, and finally returning him to the bath, in which he remains for from four to six hours. For localized eruptions, green soap in combination with tar and alcohol serves a useful purpose, either in the proportion of equal parts of the three ingredients, or by combining them in other proportions, as, for example:

R	Saponis mollis,	3iv;	120	
	Ol. rusci, }			
	Glycerin, }	āā 3j;	30	
	Ol. rosmarin.,	3jss;	6	
	Spts. vin. rectific.,	Oss;	240	M.
Sig.	For external use.			

Other combinations of service are the "liquor picis alkalinus," the formula for which is given in the chapter on Eczema; or Wilkinson's salve, as modified by Hebra, the latter combining the remedial effects of sulphur, tar, and soap, as follows:

R	Sulphur. sublimat.,	}			
	Ol. rusci (erud. vel. rectific.),		āā 3ss;	15	
	Saponis mollis,	}			
	Adipis,		āā 3j;	30	
	Cret. præparat.,		3ijss;	3 33	M.
Sig.	Wilkinson's salve, modified.				

Where the sensitiveness of the skin to the action of tar has not been tested, or when the skin is particularly tender,¹ a small quantity of the Wilkinson salve may be added to any simple ointment, or Spender's ointment of tar (see the chapter on General Therapeutics) may be substituted; afterward 1 drachm (4.) of the oil of tar, or of oleum rusci, to the ounce (30.) of oil of almonds or of alcohol, may be employed.

When toleration is established the tar may be rubbed over the patches in a pure state with a stiff brush, a procedure preferred in some parts of Germany, after which the patient either remains for

¹ Cf. Burnet, J., Treatment of psoriasis in children, *Merck's Arch.*, 1908, x., 171.

some hours in bed, or is powdered with soapstone and bandaged with flannel, so that when the clothing is replaced it may not adhere to the tar. Naphthalin, ichthyol, and carbolic acid operate in psoriasis in the same way as the tars, but are decidedly inferior to the latter.

Absorption of any tarry compound applied externally may result in general toxic symptoms, including fever, vomiting, diarrhœa, strangury, or the elimination of the toxic agent in secretions which are blackened by its presence. These symptoms are usually relieved in from twenty-four to forty-eight hours after discontinuance of the drug.

Hartzell¹ has injected atoxyl in the gluteal muscles in the case of eight patients who were psoriatic, with apparent benefit.

Pyrogallol, first suggested as a remedy for psoriasis by Jarisch, is inferior to chrysarobin. The fact that several deaths have been reported as consequent upon the use of this acid deters many from making trial of it in a painless and merely disfiguring disease. It is used in a 10 per cent. vaselin ointment, is effective though less rapid in effect than chrysarobin, is cheaper, is odorless and painless, and it discolors to a less extent the sound skin. Both remedies are capable of being absorbed from the skin-surface, and of producing constitutional symptoms (pyrexia, strangury, and blackish evacuations); but in the case of pyrogallic acid only have fatal results followed.

Kaposi² was the first to employ beta-naphthol ($C_{10}H_8O$) in psoriasis, as also in eczema. It may be applied in alcoholic solution. Following the employment of a 15 per cent. ointment the author reported speedy disappearance of psoriatic patches. It did not stain the skin, hair, or nails.

Crocker, of London, similarly uses thymol in ointment, $\frac{1}{2}$ scruple to $\frac{1}{2}$ drachm (0.66–2.) to the ounce (30.); and Williamson advises turpentine, 2 drachms (8.) to the ounce (30.) of olive-oil, with the odor corrected by the oil of lemon.

Circumscribed areas have been treated successfully by the daily application of compresses wet in a 1:300 or 1:200 solution of potassium permanganate (Hallopeau³), or in 70–90 per cent. alcohol containing 2 per cent. of salicylic acid (Lau⁴).

For inveterate cases, Unna and Dreuw recommend the following:

℞	Acid. salicylic,	5ijss;	10
	Chrysarobin., }	āā 3v;	20
	Ol. rusci, }		
	Saponis mollis, }	āā 3vj;	24 M.
	Vaselin., }		
Sig.	For external use.		

¹ J. A. M. A., 1908, vii., 18, 1482.

² Wien. med. Wehnschrft., xxxi., pp. 617, 641, 681.

³ Annales, 1902, s. iv., iii., p. 518.

⁴ Semaine méd., Sept. 13, 1899.

Blaschko¹ finds Roehard's formula of value in stubborn cases which do not yield to chrysarobin:

R	Iodi pur.,	gr. x;	66
	Hydrarg. chlorid. mitis,	gr. xxvj;	17
	Vaselin, vel adipis,	q.s. ad ʒiij ʒijss;	100 M.

These stronger applications must all be used with caution, and any dermatitis produced should be treated with soothing ointments.

The nitrate, as well as the iodides and oxides, of mercury is applied by many practitioners in the form of ointment to patches of psoriasis usually few in number and limited in extent. The action of these agents, however, is inferior to that of those already named; and the range of their availability being limited, they should be esteemed lightly in the topical treatment of the disease. Other articles more recently vaunted in the external treatment of psoriasis are: thilamin, which seems to possess some value; hydracetin; cacodylic acid; rufigallic acid, 10 per cent. in unguent form; cupric oleate; anthrarobin; and gallacetophenol, 5 to 10 per cent. in salve or in traumaticin.

Radiotherapy is a clean and efficient method of local treatment in psoriasis. In the majority of instances psoriatic lesions disappear with more certainty under X-rays than with other local measures. The rays should be employed with great caution, and a dermatitis should not be induced. Few exposures of moderate intensity suffice. The psoriatic skin responds readily to the treatment but may become the seat of dermatitis even when exposed to an amount of rays which would be considered moderate in other conditions. Telangiectasia is prone to develop in areas in which an active dermatitis has been induced. Recurrence of lesions happens after radiotherapy as after other methods of treatment. Great caution is necessary in treating a series of recurrences, especially if the recurring lesions occupy areas formerly involved. Radiotherapy is not recommended in psoriasis of the scalp, and should be the method of choice only in selected cases.

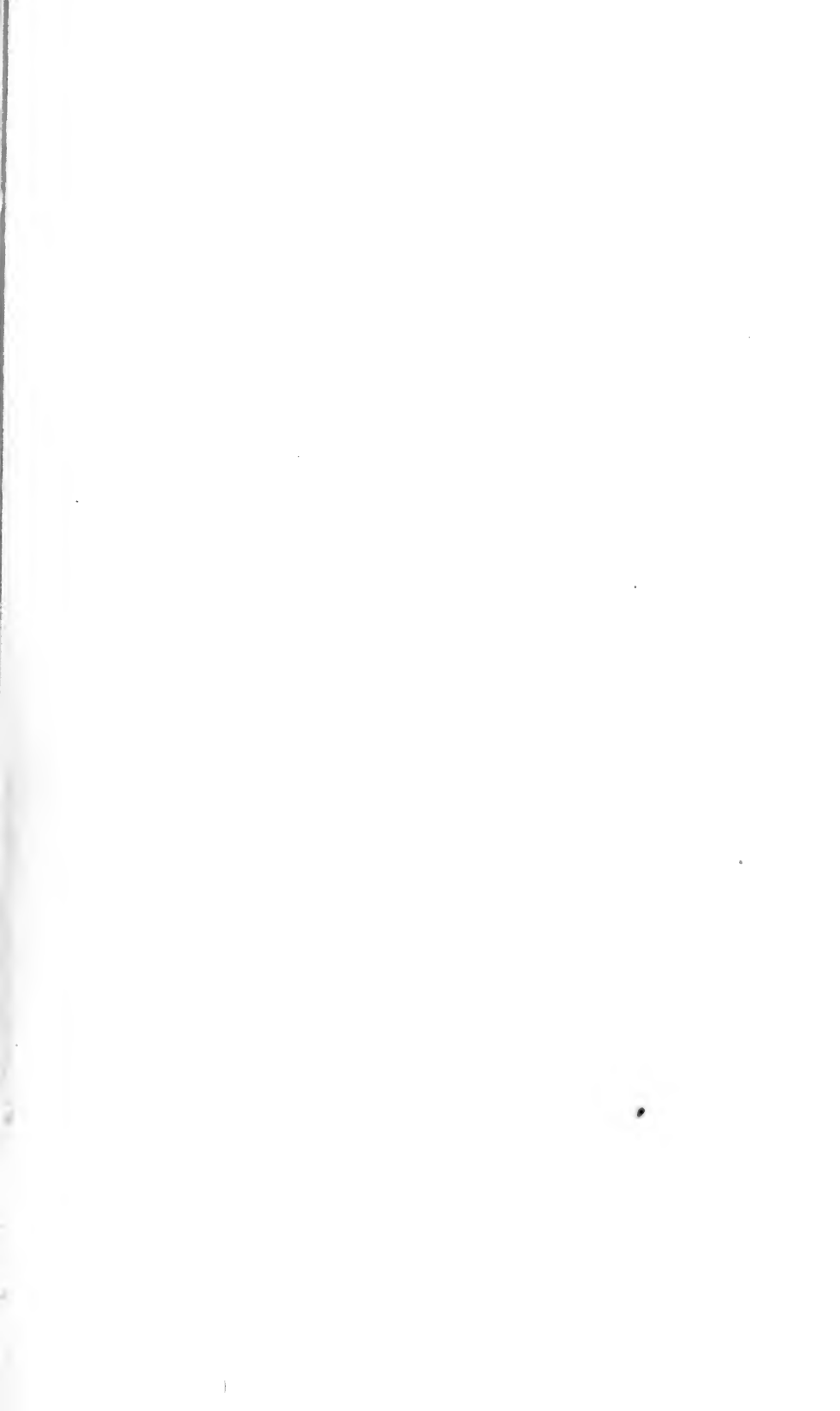
Prognosis.—The permanent relief of psoriasis is not insured by any treatment of a grave case, though hundreds of patients are permanently relieved by even the simplest treatment. The disease often recurs, and may do so repeatedly for the greater part of a lifetime. Permanent relief, therefore, should be neither predicted nor promised in any case. Once relieved, it should be the aim to guard against all possible recurrences. After relief of any obstinate or recurrent attack, as also in all inveterate cases, the prognosis is greatly improved by removal to a climate suitable for the psoriatic patient.

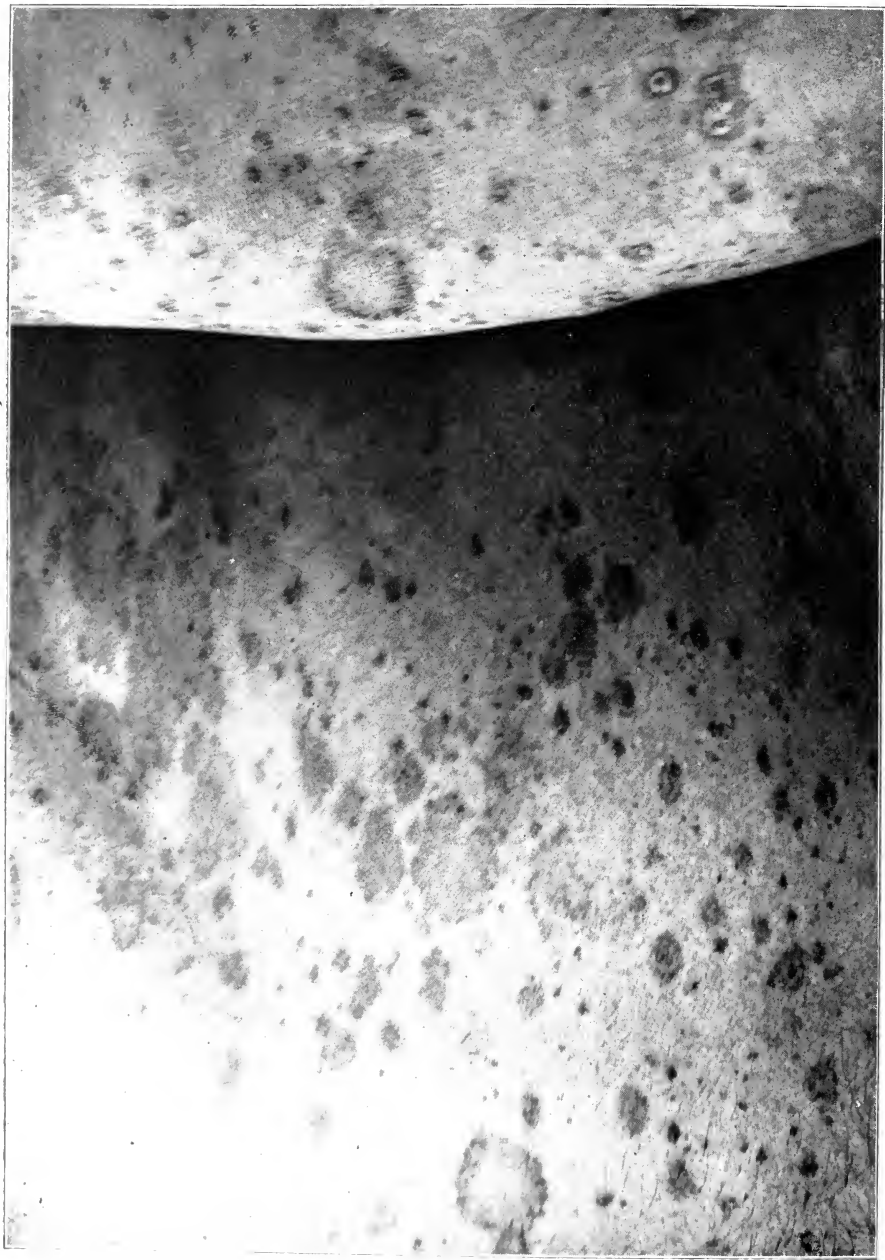
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Sylvester: A case of psoriasis cured by laparotomy and curretage, Boston M. and S. Journ., 1906, pp. 154, 583.

¹ Archiv, 1901, lvi., p. 253.





PITYRIASIS ROSEA.

(PITYRIASIS MACULATA ET CIRCINATA, HERPES TONSURANS MACULOSUS, PITYRIASIS CIRCINATA. *Fr.*, PITYRIASIS ROSÉ DE GIBERT, PITYRIASIS CIRCINÉ ET MARGINÉ, PITYRIASIS DISSÉMINÉ, PITYRIASIS RUBRA AIGU, ROSEOLE SQUAMEUSE (CHAPARD).)

Pityriasis rosea is a mild febrile disorder of specific character and determinate course, in which appears a cutaneous, usually symmetrically disposed, exanthem in the form of multiple, circumscribed, superficial, roundish or oval-shaped, yellowish and rosy patches, covered with fine scales and seated for the most part on the trunk. This disorder was recognized and described first by Gibert,¹ and later by Bazin, Horand, Duhring,² and others.³

Symptoms.—The subjects are commonly young adults but the disease is seen in children and in middle life in both sexes. The outbreak of the malady may be preceded for a variable time by languor, lassitude, inappetence, or a feeling of chilliness. Occasionally the first noticeable symptom is the occurrence of mild fever, the body-temperature rarely rising above 102° F. There may be slight swelling of the submaxillary glands and of those of the neck. General adenopathy is reported. In acute cases there may be distinct congestion of the fauces.

In some, Brocq⁴ believes in all, cases the general outbreak is preceded for a week or ten days by a single lesion situated usually at the side of the trunk. Searching the surface of the skin after the eruption is fully developed, this "primary lesion" may often be recognized as the largest, most conspicuous, and most brilliant in hue of all the patches exposed to the eye. The eruption, however, often escapes recognition for a time after its appearance on account of its sparseness or the trifling degree of pruritus it arouses. When fully developed, it is characterized by the conspicuous appearance over large surfaces of the trunk, especially upon the integument covering the clavicles, the ribs, and the scapulæ, rarely on the exposed face and hands, of numerous pinhead- to small-coin-sized, circumscribed, round-

Neuberger: Bemerkungen zur Psoriasistherapie, *Derm. Zeitschrift*, 1906, xiii, p. 172.

Pautrier, L. M.: Treatment of psoriasis by swathing with ointment (Maillots de pomade), *La Presse Médicale*, 1905, p. 683.

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Joseph, Max: *Derm. Centralb.*, 1906, p. 358.

¹ *Traité pratique des maladies de la Peau*, Paris, 1860, i., 402.

² *Amer. Jour. Med. Sci.*, 1880, lxxx., p. 359.

³ Moingeord, Thèse de Paris, 1889; Chapard, Thèse de Paris, 1885; Thibierge, *La Prat. Derm.*, 1902, iii., 894, with colored plate.

⁴ *Annales*, 1887, s. ii., viii., p. 615.

ish or oval-shaped, slightly elevated, macular or maculo-papular lesions which are fitly designated by Thibierge as "medallions." These lesions may be discrete, closely set, or confluent, and instead of being elevated may be either on a level with the general surface or slightly depressed, with an annular border. They are dry, covered with furfuraceous rather adherent scales, and vary in color from a yellow or tawny (chamois-skin) shade to a deep red. The infiltration is slight, and the patch is situated superficially. Itching is commonly inconspicuous among the symptoms.

The fully formed disks vary in long diameter from the width of a finger-nail to three or four centimetres. The oval contour is that more often recognized as characteristic of a well-developed lesion, the long axis of the disk usually corresponding with the lines of cleavage, and the terminal extremities of the oval slightly frayed by the irregularity with which the fine branny scales are there disposed. A tawny, salmon-shade is highly characteristic of the disease, the patch slightly enlarging by peripheral extension, and leaving a relatively clear centre. The scales have often a silvery grayish color. The eruption may be fairly well generalized, but the face and other exposed parts of the body usually escape, though the scalp may be involved. In the latter event the hairs are unaffected. The evolution of the eruption may be by successive development of the eruptive elements at intervals of one to ten weeks, the first being generally the most profuse and brilliant.

The variations exhibited by the exanthem in this affection are distinct, but are scarcely ever sufficient to mask the characteristic appearance of the oval or circular plaques over the neck, the arms, the abdomen, or the extremities; sometimes first appearing over the latter and extending thence to the trunk. At times a retiform expression is given to the picture by coalescence of the patches. There may be moderate itching with nocturnal exacerbation, but the usual type of the disease is mild. The affection runs its course ordinarily in from ten days to six weeks, but may last several months if new lesions continue to appear. Recurrences are rare.

Etiology.—The causes of this disease are obscure. It is without question more common in the spring and in the autumn than at other seasons. Bazin believed it occurred chiefly in lymphatic and scrofulous patients. Most patients are young (fifteen to forty years of age), many are of the female sex, have light hair and delicate skins, and have been enfeebled by physical fatigue or by overtaxation in school. Profuse perspiration has been assigned as a cause by Horand. Though no true epidemics are reported, and positive evidences of contagion are wanting, it occasionally happens that the disease is so unusually prevalent during a few weeks in a given locality as to suggest an epidemic; there are also instances in which two members of the same family were affected. (Crocker, Zeisler, Fordyce, G. H. Fox.) It is possible that the disorder is feebly infectious and allied to the exanthemata. Szoaboky, in 50 per cent.

of 119 cases of this disease, recognized that there was but slight febrile movement before development of the eruption. Of the entire number of patients one only had a return of symptoms. The author, after microscopic examination failed to recognize a parasitic etiology for the disease; but in 66 per cent. of cases, discovered that there were functional troubles of different character connected with the nervous system (sweating, trembling, pallor and redness, headaches, and exaggerated reflexes).

Pathology.—The histopathology of the disease has been studied by Darier, Unna, Hollmann, and Sabouraud. The changes begin apparently in the papillary body and the subpapillary layer of the cutis and include a dilatation of the vessels, perivascular cell-infiltration, and œdema. As the disorder progresses these changes are more marked, especially the perivascular cell-infiltrate. The rete shows decided intracellular œdema and proliferation of the prickle-cells, especially in the interpapillary portions. As the disease approaches its acme, minute vesicles, not visible on macroscopic examination, form beneath the horny layer, which later is exfoliated. Sabouraud states that these vesicles are found in the outer layers of the epidermis much as the "dry abscesses" described by Munro are formed in psoriasis. The absence of polynuclears (phagocytes) in the vesicles leads him to believe the disease is not parasitic, but a vesicular erythema of toxic origin. Oppenheim and Mewborn, however, believe that there are evidences of a microbic origin to the disease. The former recognized double contoured organisms suggesting an oïdium, which in one instance appeared to transmit the disease from cultures; while the latter found a mould-fungus with grape-like cluster of spores.

Diagnosis.—When fully developed and presenting characteristic lesions with a yellowish-brown centre and a pale frayed border covered with fine scales, the diagnosis is simple, especially if a number of the oval patches show the usual arrangement with the long axes in the lines of cleavage. When the lesions are numerous but less perfectly developed, and are of the smaller, maculo-papular and more inflammatory type, the disease may resemble a maculo-papular syphilide so closely as to defy even the expert. In the absence of all other evidences of syphilis, delay of a few days usually will permit the development of either the typical oval lesions of pityriasis rosea, or of other signs of syphilis. In syphilis, the elementary macules are uniformly smaller, much less disposed to scale. Ordinarily the lesions of pityriasis rosea are less infiltrated, are of a brighter but paler tint, and are more rapid in evolution than those of syphilis. The congestion of the fauces in the former is of a bright-red color and diffuse, while that of syphilis is dull red and circumscribed.

Dermatitis seborrhœica.—In this disease the slow development of the lesions, their distribution over the scalp, sternum, and between the scapulæ rather than on the trunk along the lines of cleavage, the coarser and more abundant scales, the fine papules on the one hand,

or large areas on the other, and the absence of atypical oval lesions of pityriasis rosea, will establish the diagnosis. Cases there are in which the differential diagnosis is exceedingly difficult or almost impossible, and which suggest an intermediate stage between the two disorders.¹

Psoriasis.—In psoriasis the patches are infiltrated, elevated, and more sharply defined. The abundant, imbricated, and silvery-white scales, the bleeding points beneath, and the distribution of the lesions are points of value in the diagnosis.

Ringworm.—In ringworm of the glabrous skin the lesions are rarely so numerous or so symmetrically distributed. The areas are more definitely circular, more circumscribed, and often display minute vesicles at the periphery. The areas showing clearing centres are larger than those of pityriasis rosea. Finally, the fungus can be demonstrated in the scales.

Treatment.—Pityriasis rosea, as a rule, is a self-limited disease in which the duration and career vary greatly in different cases. Consequently it is difficult to judge of the value of treatment in a given case. Systemic treatment should be varied to meet the indications in each instance. The febrile and throat symptoms, if present, should receive proper attention. In many cases no internal treatment is required. Crocker believes the course of the disease is shortened by giving salicin in 15 grain (1.) doses three times a day. The diet should be light and simple. Tonics are often indicated. Locally, mild sulphur or other antiseptic ointments appear to shorten the duration of the disease in many instances. A convenient and simple treatment which we have employed with apparently good results in many cases is as follows: The patient takes a bath at night before retiring, and after drying the skin applies to the areas a weak vinegar or dilute solution of acetic acid, and before this dries follows with a 10–15 per cent. solution of sodium hyposulphite. In a few moments, after the surface is dry, a simple dusting-powder may be applied. In the few instances in which itching or burning is annoying, the under-clothing should be of silk or cotton, and the surface of the body should be kept constantly covered with some adherent powder, like zinc stearate. Rarely is it necessary to use soothing, mildly antipyretic lotions or ointments, such as are recommended for the early stages of eczema. In unusually extensive cases in which itching is a pronounced feature, brief exposures to x-rays are followed promptly by cessation of subjective sensations and by rapid involution of the lesions.

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¹ *Cf. Besnier, Annales*, 1889, s. ii., x., p. 108.

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PARAPSORIASIS.¹

(LICHEN VARIEGATUS (CROCKER), RESISTANT MACULO-PAPULAR SCALY ERYTHRODERMIAS (FOX and MACLEOD²).)

Parapsoriasis is a generic term introduced by Brocq to designate certain eruptions of the skin which though differing one from another in appearance present certain features in common. It is now universally accepted as the best name for these eruptions. Many clinicians are satisfied to designate a given case by this term without attempt to specify which particular dermatosis of the division the case represents. Whether the affections of this division are different manifestations of a single disease or several closely allied diseases is an unsettled question. Some of the cases which have been recognized as belonging to this division by all authorities have been assigned to one dermatosis of the division by one, and to another dermatosis of the division by another observer. The case reported by Anthony³ is particularly valuable in this connection because it was seen by so many dermatologists both in America and England. The occurrence of mixed forms increases the difficulty of studying these eruptions (Csillag⁴). The clinical features which the dermatoses of this division present in common are: the superficial character of the eruption; the mild degree or entire absence of infiltration of the skin and of itching; and the failure of tendency to recovery.

PARAKERATOSIS VARIEGATA.⁵

(PARAPSORIASIS LICHENOÏDE.)

This was the first dermatosis of the parapsoriasis group to be recognized as an independent affection. The first case was described by Unna and Santi and Pollitzer in 1890. It had previously been designated superficial lichen planus. The eruption usually occurs in the third or fourth decade of life; it affects robust individuals. It is universally distributed over the trunk and most of the extremities. It is retiform in character, almost as if the patient were covered with a net; more closely studied, the net-work is seen to be made up of red streaks and patches, varying in shade in different parts of the body (*P. variegata*); the eruption is sharply defined, very superficial and covered with a fine lamellous scale. The meshes of the net are occupied by irregular, slightly sunken areas of healthy skin.

¹ Annales, 1902, s. iv., iii., p. 433.

² J. C. D., 1901, p. 424 (histology).

³ J. C. D., 1906, p. 455 (literature).

⁴ Archiv, lxxvi., p. 3 (mixed form).

⁵ Monatshefte, 1890, i., p. 444.

The premycotic eruption of mycosis fungoides may present the clinical picture here depicted. Cases which have been accepted as probable cases of parakeratosis variegata and subsequently by the development of infiltration and microscopical examination have been shown to be cases of premycotic mycosis fungoides are reported by Jamieson,¹ Hudelot, Gaston,² Sherwell, and also the first case of Unna. Some students of the subject will not accept as examples of the disease cases which do not present the typical retiform appearance.

The cases which presented the plaque arrangement are: that referred to by the writer and accepted by Unna, that of Méneau, and that of Anthony.

DERMATITIS PSORIASIFORMIS NODULARIS.³

(PITYRIASIS LICHENOIDES CHRONICA. *Ger.*, EIGENARTIGES PSORIASIFORMIS UND LICHENOIDES EXANTHEM; *Fr.*, PARAPSORIASIS EN GOUTTES.)

This form of parapsoriasis was first described by Jadassohn in 1894. The eruption is very superficial, consisting of pin-head to pea-sized papules, round, or oval in form, of an intense clear red color; the larger are paler, they are well defined, the smaller are slightly pointed, while the larger are flat with an occasional central depression; they are somewhat firm, some are follicular, scales are not always visible but when scratched, may be removed from any of the lesions. The scratched lesion is red and bleeds but little; there are no bleeding points as in psoriasis. The scale when removed is thicker in the middle than on the periphery. New papules or nodules appear here and there so that the eruption gradually increases. In the beginning there is an areola of redness. Pick,⁴ Civatte (Brocq's Clinic) Milian and Pinard⁵ have reported cases of this disorder which on microscopical examination were found to be tuberculides. Civatte surmises that they are all of this nature.

ÉRYTHRODERMIE PITYRIASIQUE EN PLAQUES DISSÉMINÉES.

(PARAPSORIASIS EN PLAQUES.)

Brocq, White⁶ and Little have reported cases of this affection. White gives the following description of the appearance of the eruption in one of his cases. "The front and lateral surfaces of the trunk were thickly occupied by irregular circular or oval areas varying from $\frac{1}{2}$ to $1\frac{1}{2}$ inches in longest diameter. They were generally

¹ J. C. D., 1901, p. 441.

² Annales, 1904, s. iv., v., p. 1090.

³ Archiv, lxx., p. 61 (literature).

⁴ Archiv, lxxix., p. 411.

⁵ Annales, 1907, s. iv., ix., p. 477.

⁶ J. C. D., 1900, p. 536.

PLATE VII

FIG. 1

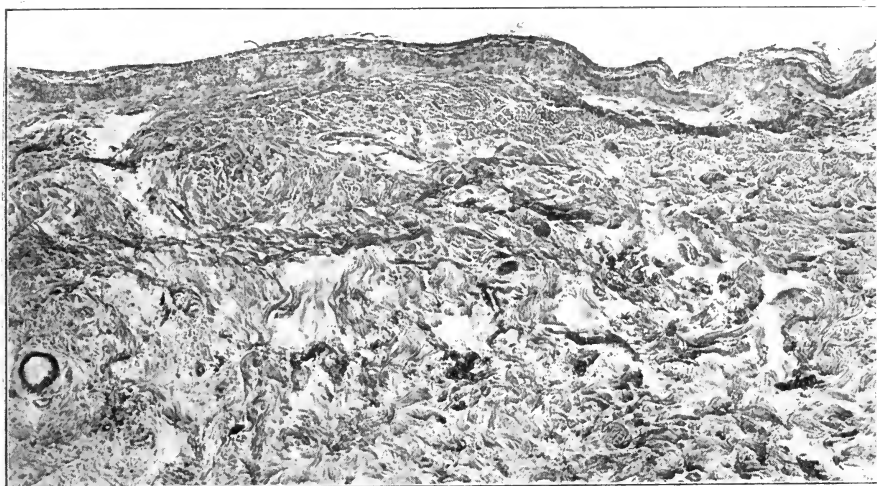
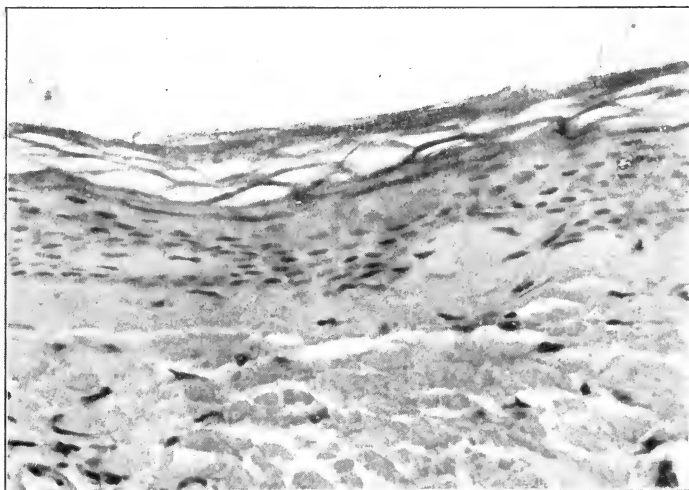


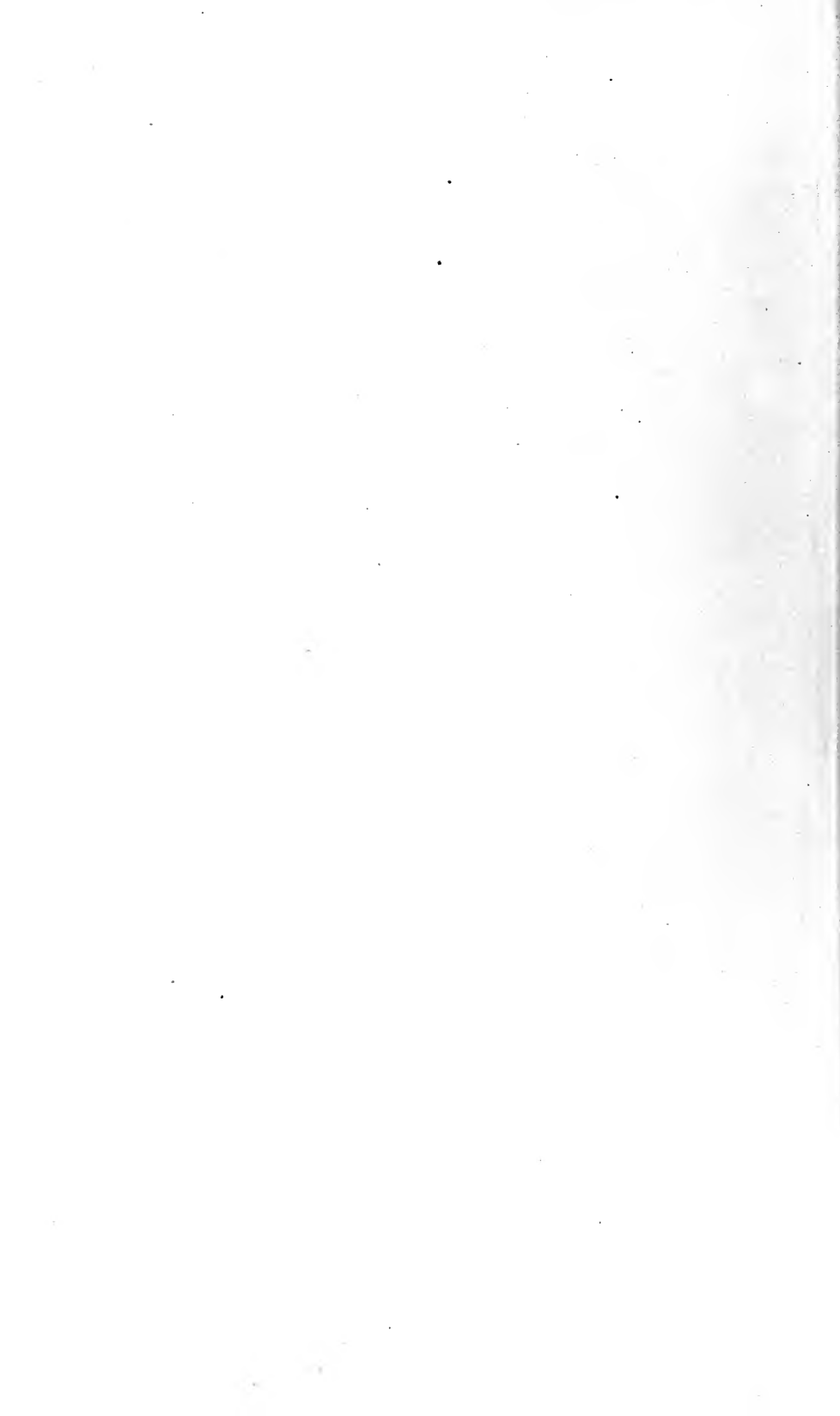
FIG. 2



Erythrodermie Pityriasis. (C. J. White.)

FIG. 1. (Section.) Low power. Represents the section as a whole, with the most gravely affected regions of the corium and of the epidermis in the centre of the photograph. The great atrophy of the epidermis and the disorganized condition of the corium are well shown. On each side of the photograph the corium is beginning to appear more normal, and on the left hand the various normal deeper structures are present. Hematoxylin-eosin.

FIG. 2. (Section.) High power. Represents the most severely affected area of the epidermis. The rather increased stratum corneum and the marked changes of the other layers are clearly seen. Hematoxylin-eosin.



discrete, but here and there formed larger patches by confluence. They were all habitually of a light brown color, but might become somewhat redder on exposure to cold. The brown tint disappeared partially on long and firm pressure. They were mostly free from visible scales (the patient bathed frequently) and presented neither elevation nor infiltration. They provoked no subjective sensations. On the back, patches were less abundant and slightly redder."

Rille and Riecke¹ classify these cases as a variety of idiopathic atrophy of the skin. The fact that the elastic fibres are not affected in this disease while they disappear in ideopathic atrophy, excludes this possibility.

XANTHO-ERYTHRODERMIA PERSTANS (CROCKER).²

In this form of eruption, the lesions affect the covered parts of the body. The disease develops symmetrically, very gradually, and at first in small numbers of patches but as the older patches never disappear spontaneously, while fresh disks are in continual evolution at short or long intervals, large areas are involved. The patches may remain discrete or coalesce. The disease is apt to first appear on the thighs and legs. A simple patch is from one inch to three inches in its longest diameter and oval in shape. The borders are not well defined but there is no difficulty in discerning the morbid from the healthy skin. There is no elevation of the lesion. There is a slight degree of infiltration in some older patches while in those more recent and smaller it is imperceptible; occasionally they look like mere stains. The color is either pale pink or yellowish; the surface is smooth in the trunk but is often slightly rough on the arms and thighs; below the knees the surface may be distinctly rough or even exhibit branny scales. The eruption may disappear spontaneously.

Histology.—A comparative study of the histology of these eruptions has not been made; it is not known in what respects if any they differ. The features they present in common are epidermal atrophy. The epidermis is narrowed to simply a few rows of cells. There is an inflammatory exudate surrounding the dermal vessels, with no change in the dermal bundles or elastic fibres.

DERMATITIS EXFOLIATIVA

(GENERAL EXFOLIATIVE DERMATITIS. *Fr.*, ERYTHRODERMIE EXFOLIANTE (BESNIER), DERMATITE EXFOLIATRICE.)

Exfoliative dermatitis is a disorder in which over considerable portions or the entire surface of the body the skin is reddened and covered with lamellated scales which are exfoliated freely from the

¹ Archiv, lxxxiii., p. 51.

² B. J. D., 1905, p. 119.

surface; the disease may be accompanied by itching or burning sensations, and by febrile and other signs of systemic disturbance; and may pursue an acute or more commonly a chronic course.

Some confusion, both as to the names of diseases and as to the diseases themselves, has existed in connection with the subject of all generalized exfoliative cutaneous disorders. More investigation is needed before definite limits can be established for several of the dermatoses of this class. By some, the term dermatitis exfoliativa is held to be synonymous with pityriasis rubra. In these pages the term pityriasis rubra is restricted to the disease first described under this title by Hebra, and the name Dermatitis exfoliativa, is employed as a generic designation of the entire group of dermatoses, acute or sub-acute in type, accompanied by generalized and extensive exfoliation of scales from the cutaneous surface.

Etiology.—Male somewhat outnumber female subjects of the disease, the most being between twenty and forty years of age.

The several toxæmias, gout, rheumatism, tuberculosis, chronic alcoholism, the general causes of anæmia, asthenia, and cachexia have all been cited as etiological factors in the several forms of exfoliative dermatitis, and in cases each of the causes named has been effective. Central and peripheral neuroses are at times at fault. The disease is in many cases unquestionably profoundly affected by climatic influences often first appearing in the autumn of the year. Medicamentous ingesta and injecta (quinine, arsenic, antipyrine, antitoxin sera) may produce conditions of the same character.

Pathology.—The pathological findings in most cases have been typical of the usual processes of inflammation, including thickening of the horny layer, early accentuation and eventual disappearance of the granular layer, œdema of the rete, a plastic felting together of the upper layers of the corium with loosening of those lying deeper, dilated blood-vessels, absence of mast-cells, and everywhere cell-infiltration.

Diagnosis.—The disease may be differentiated from scarlatina by the absence of fever, the condition of the tongue, and the fact, when such can be substantiated, of previous attacks. Psoriasis, lichen ruber, and dermatitis seborrhoïca, may all be recognized by a study of their distinctive features, remembering that it is exceedingly rare that any one of the disorders mentioned becomes absolutely generalized; that in most the itching is far more severe than in exfoliating dermatitis; and that desquamation in fine scales, sero-pustular oozing with crusting, and localization in certain regions of the body, each different from the other, are all of diagnostic value. At times the pre-fungoid stage of mycosis fungoides may suggest some of the early manifestations of Dermatitis exfoliativa; and the possibility of such an issue, even though not at first demonstrable, should not be forgotten.

The true character of the disease cannot be determined always

at the time of its onset. Other inflammatory and scaling conditions of the skin must be excluded by the absence of the features characteristic of each. In more advanced stages the history of the disorder, as well as the absence of the characteristic features of other diseases with which it might be confused, will be of value in diagnosis.

From pemphigus foliaceus, *Dermatitis exfoliativa* is distinguished by the absence of bullæ and by the absence in most cases of grave systemic disturbance.

The disorder may rarely closely simulate pityriasis rubra of Hebra, but the history of steady progression without remissions, the universally reddened scaling epidermis without infiltration, the ultimate atrophy of the skin, the not infrequent ulceration and gangrene, and finally the serious systemic conditions—all classical features in pityriasis rubra—rarely are found in such combination in *Dermatitis exfoliativa*.

Treatment.—As at least some cases are due to a toxæmia, the general condition of the patient should be investigated thoroughly, and treatment instituted to meet indications. Mook¹ and Engman of St. Louis report favorable results after treatment of *Dermatitis exfoliativa* with quinine in large doses. The tolerance in all cases was remarkable. The amount taken in twelve hours was increased to 80 and 85 grains, the dosage being reduced when there was tinnitus aurium. Arsenic is occasionally of value, but as a rule fails, as do other so-called specific remedies, to relieve the condition. Sodium cacodylate falls in the same category. Any medicament which induces profuse sweating, such as aspirin, jaborandi, and pilocarpin, may give relief, and in some instances their use has been followed by recovery. Locally, applications should be employed to keep the skin soft and to relieve itching or other sensations which may be present. For this, Hebra's ointment, 1 part to 4 of vaselin with from 5 to 10 grains (0.33–0.66) of salicylic acid to the ounce (30.) of the whole, is usually grateful to the skin. An ointment often employed with great advantage over the entire cutaneous surface is:

℞ Sulphur. precipit., }	āā gr. ijss;	166
Acid. salicylic., }		
Bals. Peru., }	m. x;	66
Ungt. petrolat., }	āā ʒss;	15 M.
Ungt. ag. ros., }		

Other simple ointments and oils with or without the addition of small amounts of salicylic acid, carbolic acid, ichthyol, tar, or other remedies may be of value. As a rule, mild preparations are more serviceable than the stronger remedies. One of the combinations of lime-water, olive oil, and zinc-oxide, described in the treatment of eczema, is occasionally of service. Emollient, starch, and hot baths are generally comfortable to the skin.

Prognosis.—In the majority of instances the patient eventually

¹ Mook, J. C. D., Sept., 1908, p. 408.

recovers, though convalescence often is protracted and delayed by frequent recurrences. A small proportion of cases progress to the formation of universal or exfoliative dermatitis from which the patient rarely recovers. In grave and protracted cases the general health of the patient suffers and a fatal result may be expected.

PITYRIASIS RUBRA (HEBRA TYPE).

(Gr., *πίτυρον*, bran.)

(DERMATITIS EXFOLIATIVA. *Ger.*, ROTHKLEIE; *Fr.*, PITYRIASIS RUBRA AIGU.)

Pityriasis rubra is a rare, chronic, and usually grave inflammatory cutaneous disease, involving as a rule the entire surface of the body, in which the skin usually without infiltration becomes deeply reddened and exfoliates lamellæ of scales in large quantities. There is commonly no subjective sensation save that of chilliness; and the later symptoms and sequelæ of the affection are: shedding of the hairs, adenopathy, pigmentation, atrophy, and, as a consequence of pressure and friction-effects, ulceration. The cutaneous manifestations are probably but symptoms of systemic disease which in the majority of cases terminates fatally.

The disease here described is the Pityriasis rubra of Hebra, which should not be confused with other forms of dermatitis exfoliativa.

Symptoms.—This disease is characterized by a superficial hyperæmia and inflammation of the skin, declared in patches or by a diffuse redness of a vivid or lurid tint, and by an abundance of small or large, lamellated, bran-like scales, which are continuously exfoliated from the epidermis throughout the course of the malady. Patients rarely present themselves for observation until a considerable portion of the body-surface is involved; but Kaposi states that in two patients observed by him the disease was first noticed in the neighborhood of the articulations. There is no vesiculation, pustulation, moisture, or crusting. The palmar and plantar surfaces are usually less distinctly reddened than the face and the extremities, having at times even a pallid hue, but they are always covered with a scaling epidermis.

Under pressure with the finger the redness subsides or assumes a yellowish shade, while, as a rule, when the integument is gathered up between the finger and thumb, no infiltration can be recognized. Exceptions, however, have been noticed by several observers.¹ The temperature of the skin is slightly increased. The exfoliation, as the diseases progresses, is one of its most striking characteristics, the scales accumulating in large quantities in the clothing of the patient, who is engaged, as a French writer has it, in the labor of stripping himself involuntarily of his epidermis.

¹ We have observed several such cases. Cf. "Pityriasis Rubra," Chicago Med. Jour. and Exam., Feb., 1881.

The disease persists for months or for years, being always more severe in expression as it advances, the papery scales being shed more abundantly and in larger flakes, leaving a smooth, shining occasionally purplish, or even cyanotic skin. In the patients observed by Jamieson,¹ the skin was so dark hued as to suggest the color of a mulatto. Gradually the patient becomes conscious of an increasing sense of chilliness, as if deprived of sufficient body-covering. The itching may be absent, be moderate, or be severe. There may be instead sensations of stiffness, burning, and tingling. Later the integument seems to retract, as if it were insufficient to encompass the body, and becomes subject to fissure from extension and contact, while the lower extremities may be œdematous. This retraction may be so marked that ectropion of the eyelids may ensue, the fingers may remain semiflexed, and wide opening of the mouth may become difficult. The skin over bony prominences becomes thin and stretched, and often fissured, or becomes the seat of superficial ulcers or of gangrene. Thinning of the skin of the soles of the feet may render walking painful or impossible. The hairs and the nails lose their lustre and become friable, and the hairs often fall, though the nails may escape.

The influence of this epidermal exfoliation, involving, as it does, finally, every portion of the body-surface, does not fail toward the end to be felt by the vital forces. Alternating chills and febrile processes, pneumonia of a low grade, colliquative diarrhœa, tuberculosis, subcutaneous abscesses, bedsores, and even gangrene of the skin may close the scene.

Hebra and Kaposi together had under observation twenty-one patients affected with pityriasis rubra, who, with a single exception, died from its effects. It will thus be seen that the disease is rare. A few cases have been reported by British authors. Among Americans, Duhring, George H. Fox, of New York, and the writer, have published reports of cases. We have had under observation in all more than a score of typical instances of the affection. The disease is one of early or of middle life, and affects preëminently the male sex.

The progress of the disease is slow, lasting for years, though in a few instances it has proved rapidly fatal. The time required for extension to the entire surface of the body varies from a few days to two years or more, but averages from three to eight months. From the first the tendency of the disease is to progress slowly to a universal atrophy of the skin. Involution of areas, or periods of improvement of the cutaneous symptoms, are very unusual. There are no red points visible as in other forms of scarlatinoid-shaded eruption, and the color when the palms and soles are involved only appears after the thick epidermis of these regions has been shed. Sweat may or may not be secreted in the course of the disease. The tongue is bright red in the early stages; later it is covered with a brownish crust; it occasionally undergoes exfoliation. There may be a secre-

¹ *Edinburgh Med. Jour.*, 1880, xxv., p. 879.

tion from the skin which at times stains the linen. Rhagades may form, especially in the palmar and plantar regions. While in the instances of this disorder first described in Vienna there was no infiltration of the skin, this change has been observed in other typical instances, but usually not deeply implicating the corium. The nails may be separated, tilted up from the nail-folds, softened, thinned, fissured, "worm-eaten," or otherwise altered. The chief systemic symptoms recorded are: languor, chilliness, and even severe rigors alternating with febrile temperatures of recurrent type, albuminuria, diarrhoea, pulmonary œdema, icterus, interstitial pneumonia, bronchitis, and rheumatism.

Etiology.—The causes of the disease are unknown. It is more common in men than in women, and in adults rather than in children. The cutaneous phenomena are due in each case to some constitutional disorder which in the early stages frequently presents no other symptoms than those manifested on the skin, the patient being apparently in good health. Visceral troubles are recognized chiefly at a late period of the malady, when it would appear that the cutaneous mischief is sufficiently extensive to induce them. The wide range of these disorders suggests that the cutaneous disease may result from a number of visceral maladies.

Pathology.—Montgomery and Bassoe found that the necropsy in their case pointed to a primary infection of the skin followed by a secondary general marasmus. The rete-pegs were elongated; the granular layer of the skin undemonstrable; the papillary and upper reticular layer infiltrated with cells apparently of connective-tissue origin. The deeper cutis was not involved. There was peri-vascular infiltration of numerous enlarged vessels, having a thickened intima, and blocked with blood-cells. The connective tissue below the zone of infiltration was both hypertrophied and sclerotic. There were numerous pigment-cells throughout the cutis, resembling mast-cells. Tschlenow states that the primary changes occur in the epidermis, producing secondary inflammation in the cutis which ultimately leads to complete atrophy of the skin.

Both Hebra and Fleischmann discovered coincident pulmonary, intestinal, or cerebral tuberculosis. Kaposi established an atheromatous condition of the arteries. Myelitis was discovered post-mortem in one case by Jamieson, who has been followed by others in the recognition of central and peripheral neurotic alterations. Kopytowski and Wielowieyski describe cocci which they think are factors in producing the disease.

Jadassohn's admirable investigation of the entire subject led him to the conclusion, shared by Doutrelepont, that a large proportion of all cases of the disease were tuberculous in origin. Montgomery and Bassoe state that the causative relation between the two is not at all clear.

Bowen's patient¹ was said by Dr. Charles J. White to have suffered

¹ Discussion of Montgomery and Bassoe's paper, loc. cit.

from a small abscess in the lung which may have been tubercular.

A case of pityriasis rubra, of the Hebra type, reported by Muller¹ accompanied by tuberculosis of the lymphatic glands was more fully described after death of the subject by Fabry² who concludes after recognition of the existing tuberculosis that the contention of Jadassohn and Doutrelepon respecting the tuberculous character of a large proportion of similar cases, requires further confirmation. Halle, moreover, is doubtful as to the existence of tuberculosis in a similar case reported by him.³ The researches of Hans Hebra demonstrated in two cases that in the earlier period of the disease there is an infiltration of the integument moderate in degree, succeeded at a later period by cutaneous atrophy, in which the rete and papillæ of the corium disappear. The connective-tissue elements undergo sclerosis; and the glands and the follicles of the skin are destroyed. Pigmentation is abundant. Petrini and Jadassohn reported inflammatory infiltration of the papillary and subpapillary layers of the corium, a proliferation of connective-tissue cells, and secondary changes in the epidermis.

Diagnosis.—Many cases reported as instances of pityriasis rubra are not really such. The misinterpreted symptoms are often those of an unusually extensive psoriasis or a chronic squamous eczema, which commonly terminates favorably in the course of proper treatment.

Psoriasis rarely extends over the entire surface of the body, but at times it is thus generalized. In these exceptional forms a long history of the occurrence of typical psoriatic patches may usually be obtained, while the bleeding surface beneath the scales and the character of the latter will point to the true nature of the disease. Psoriasis occurs in healthy, pityriasis rubra in cachectic, constitutions. Extensive erythematous or squamous eczema, apart from all other symptoms, can be recognized at once by the excessive distress occasioned by the eruption. The patient lies in bed nursing his or her tender limbs, back, or belly. In the early stages of pityriasis rubra the patient may rise, dress, and move about with an expression, not of pain, but of listless apathy. His scales are not scanty and adherent, but are abundant and exfoliate freely. There is, from first to last, no history of moisture. In every generalized eczema, at one point or another, there always will be a surface which weeps. In its early periods pityriasis rubra can be distinguished from pemphigus foliaceus by the absence of bullæ and of the intolerable stench which is often emitted by the sufferer. When, however, there is present merely a generalized exfoliative dermatitis the two disorders may well-nigh be indistinguishable.

Treatment.—Arsenic administered internally seems powerless in pityriasis rubra. Cases are on record of fatal results after the ex-

¹ Archiv, lxxxvii., p. 255.

² Ibid., 1908, xci., p. 85.

³ Ibid., 1907, lxxxviii., p. 247.

hibition of this drug in prodigious quantities for long periods of time. Tar externally promises no better result. Kaposi reports a single patient relieved by the use internally of carbolic acid. Thyroid extract may be tried in chronic cases.

We have had the opportunity of verifying the improvement which may result from the administration of large doses of quinine,—as recommended by Engman,—in three cases of pityriasis rubra in our care. The dose was progressively increased from the medicinal quantities usually given, to fifty, sixty, and even ninety grains in the day, extreme care being taken of the heart's action and the audition. The tolerance of the drug was in all cases distinct, and the improvement marked.

A roborant treatment, including the employment of cod-liver oil, iron, or quinine, is generally indicated, with externally the simplest bland unguents, such as vaselin, lanolin, or diachylon ointment. They should be employed, not merely to soothe, but also to protect the skin. Continuous baths may be of service in making the patient comfortable. The clothing should be ample and unirritating, and the diet selected with a view to supporting the strength.

Prognosis.—The majority of all the cases of the pure Hebra type have terminated fatally.

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DERMATITIS EXFOLIATIVA NEONATORUM.

(KERATOLYSIS NEONATORUM; RITTER'S DISEASE.)

Under this title Ritter v. Rittershain and others have described a rare exfoliating disease of the skin in nursing infants from six days to five weeks old, occurring most commonly in foundling asylums. The disorder begins usually as a reddened, exfoliating patch, most frequently on the lower part of the face, though it may appear first on any part of the body, and rapidly spreads until the entire surface is reddened and exfoliating. The surface beneath the scales is red, usually dry, and often excoriated. Occasionally the surface is moist, and in some instances vesicles and bullæ appear in areas—a fact which led Richter and others to class the disease with pemphigus neonatorum. The angles of the mouth and the mucous outlets of the body frequently show fissures and are covered with crusts. Often the mucous membranes of the mouth, nose, and conjunctiva are involved. The duration varies. In most cases there is complete involution in from seven to ten days with few or no constitutional symptoms. Severe cases may last a month or longer with disturbance of the digestion and assimilation, and production often of marasmus. Pneumonia is of frequent occurrence. As a result of secondary infection, furuncles and abscesses are common; gangrene and sepsis may follow. When healing occurs, it is accomplished as a simple and gradual diminution of the erythema and cessation of the scaling. Recurrences are not uncommon.

Etiology and Pathology.—Observers are not agreed respecting the cause and nature of *Dermatitis exfoliativa neonatorum* and its relations with *pemphigus acutus neonatorum*. Ritter, Winternitz, Luithlen, and Bender hold that these two disorders differ in respect to the fact that in the first named disease, the prickle-cells of the rete increase, which does not occur at least to the same extent in *pemphigus neonatorum*. In two cases studied by Hedinger, the *staphylococcus pyogenes aureus* was recognized on bacteriological examination; and the author concludes that *dermatitis exfoliativa* of the new-born is merely a malignant variety of the pemphigus of infants. Ritter¹ believed in its septic origin. Kaposi considered it an exaggeration of the normal exfoliation of the newborn. To the bacteria found in the lesions or in the blood no definite etiological relation has been established. Histological examinations (Winternitz, Luithlen) show merely a superficial inflammation, often with free exudation, and excessive exfoliation of the epidermis.

¹ Ritter, *Centralzeitg. f. Kinderheilk.*, 1878, Bd. ii., and *Vierteljahr.*, 1879, vi., p. 129; Elliott, *Amer. Jour. Med. Sci.*, 1888, xev. (with survey of literature); Luithlen, *Archiv*, 1899, xlvii., p. 323; and Mraček's *Handbuch*, Bd. i., p. 757 (full bibliography); Hedinger, *Archiv*, 1906, 349 (with plate); Caspary, *Viert. f. Derm. u. Syph.*, 1884, p. 122; Bender, *Virch. Archiv*, clix., p. 1900; Hausteel, *Festschrift f. Kaposi*, 1900 (*Archiv*); Brown, *J. Am. Med. Ass.*, 1907, xlix., p. 1671; Morton, *N. Y. Med. Jour.*, 1895, June 8 (reprint); Ravogli, *Ohio St. Med. Soc.*, 1901, May 7; Patek, *C. J. D.*, 1904, xxii., p. 269; Ostermayer, *Archiv*, 1903, lxxvii., p. 109; Baker, *Exfoliative Dermatitis in the New-born (Ritter's Disease)*, *N. Y. Med. J.*, 1906, June 9, p. 1184; *Archiv*, 1907, lxxxiii., p. 270; *Monatshefte*, 1907, xliv., p. 254.

Treatment.—The nutrition of the child should be sustained with proper feeding and the warmth of the body maintained. Locally the surface should be kept covered with a soothing oil or soft ointment, and care should be taken in changing dressings not to damage the sensitive skin.

Prognosis is unfavorable, as about 50 per cent. of the infants affected with the disease die, the outcome depending largely on the strength and vitality of the child.

EPIDEMIC EXFOLIATIVE DERMATITIS.

(EPIDEMIC SKIN-DISEASE (SAVILL); SAVILL'S DISEASE.)

During the summer and autumn of 1891 an epidemic disorder with cutaneous symptoms developed in several London asylums, infirmaries, and hospitals, affecting about five hundred patients. The disease was studied with special care by dermatologists and other medical men. The brief sketch given below is based upon an excellent monograph with colored and photographic illustrations by Savill,¹ on various communications made on the subject in the columns of the *British Medical Journal* and the *London Lancet* for 1892, and on the description given by Crocker in his treatise. American cases have been recorded by Fordyce, and Colby and Winfield.

The disease occurred in two distinct clinical types, one with catarrhal exudation from the skin, resembling the moist forms of eczema, the other dry and non-discharging, resembling pityriasis rubra, and, according to Crocker, indistinguishable from that disease.

The eruptive features were apparently not preceded by prodromata, but gastro-intestinal disturbance (vomiting, diarrhœa), and in some cases sore throat either preceded or accompanied the appearance of the dermatosis. Except in patients of advanced years, there was usually post-occipital and cervical adenopathy, not to be explained as sympathetic with a cephalic eruption. The regions most frequently involved were the upper limbs, the scalp, and the face; the lower limbs less frequently.

The skin-lesions were pruritic, and were irregularly grouped, acuminate papules, with a follicular site. The face and upper extremities were more extensively invaded than the lower extremities.

The stages of the exanthem, as given by Savill, were:

a. A papulo-erythematous stage, lasting from three to eight days, in which shot-like papules were felt beneath the skin, were discrete, and were seated on a reddened, thickened, even an indurated or œdematous integument. In some cases the onset was in the form of marginate and circular nodose patches, resembling those seen in erythema nodosum; in a few cases the resemblance was to ring-

¹ An Epidemic of Skin-disease resembling Eczema and Pityriasis Rubra, by Thomas D. Savill, etc. London, 1892. Also Monatshefte, 1892, xv.; Echeverria, E., B. J. D., 1895, p. 9, Histological Study in Unna's Laboratory; Fordyce, J. C. D., 1897, p. 141; Colby and Winfried, J. C. D., 1898, p. 73.

worm, flattened papules enlarging to a circinate annular group with minute central vesicles readily ruptured.

b. An exudative stage, lasting from three to eight weeks, in which macules, vesicles, or papules soon formed a confluent eruption, the skin being of crimson hue, thickened, and scaling in flakes or in lamellated crusts in consequence of the exudation. In the moist type the papules developed to vesicles with exudation; in the dry type the exfoliation occurred in pure scales, parts of which in some cases could be collected from a patient's skin in a day. In other cases this exfoliation was in the form of an impalpable powder; it was characteristic of all well-marked cases.

c. A stage of subsidence, in which the disease proceeded to involution, leaving the skin at first indurated, polished, and brownish in color. In many cases the new skin was raw and parchment-like, smooth, shining, and readily fissured, resembling in this respect ichthyosis. In a few instances ectropion resulted, as a sequel of conjunctivitis. In severe cases the hair and all the nails were shed. There was a mortality of from 5 to 13 per cent., death resulting from exhaustion with the usual signs of subsultus, shallow respiration, and coma. Complications occurred with pneumonia, gangrene, and albuminuria. A few of the attendants upon the sick (children and patients of somewhat older years) were attacked; but for the most part the patients, and especially those succumbing to the disease, were individuals of advanced years of both sexes, inmates admitted for the management of other disorders to the institutions in which the disease prevailed.

Etiology.—The cause of the disease was not satisfactorily determined. Cocci were isolated and cultivated by Savill and Russell, but the etiological importance of these micro-organisms is yet to be demonstrated. Echeverria described a peculiar form of degeneration in the nuclei of the prickle-cells. The influence exerted upon the disease by parasitocides was beneficial to a degree; but this treatment on the whole was unsatisfactory and chiefly amounted to amelioration of the conditions of the skin.

PRIMARY EXFOLIATIVE DERMATITIS.

Sir Erasmus Wilson was first to describe a primary form of exfoliative dermatitis, distinct from pityriasis rubra in its career and termination, of which illustrations may be found in every large clinical experience. The disorder commonly begins with acute symptoms, malaise, chills, fever, and inappetence after which one or several regions of the body-surface steadily display light-tinted or deep reddish, sometimes infiltrated, ill-defined patches, which after a variable period (one to two weeks) spread over the general surface, after which the characteristic exfoliation occurs.

The articular folds of the skin, the genital region, the head, and the trunk are most often the early seat of the disease, which may

involve consecutively one part after another. The affection may be limited to one region, or several distinct regions may be involved simultaneously, as the head and the lower limbs, or the thorax and the external genitals. The hands and the feet are usually the last to be attacked. The eruption may appear in reddish patches of well-defined or of very indeterminate outline. The skin affected may be slightly or apparently not at all infiltrated and raised. The redness displayed in the regions affected with scaling may be of the brightest crimson, "erysipelatous," violaceous, or purplish shade, or with a faint suggestion of yellowness. The scales, which usually are formed in abundance, commonly are seen loosely covering the reddish integument upon which they rest, though they are shed also in profusion when the affected surface is swept lightly with the hand. They are usually whitish and bran-like, but may be larger; they are as a rule larger and coarser upon the lower limbs than over the neck, face, and chest.

In well-marked cases the features may be disfigured slightly by tumefaction of the lips, swelling of the ears, and puffiness of the eyelids. In most cases the skin is dry, but rarely is moistened with a pathological discharge. Often there is coincident adenopathy.

In the course of the disorder the hairs may fall, and in some

FIG. 57.



Primary exfoliative dermatitis.

cases the resulting alopecia is general. When the nails also are lost there is rarely any special preëxisting onychia. The mucous surfaces of the eyes, nose, mouth, and throat may participate in the general disorder and become the seat of inflammatory and, in rare cases, even of pseudo-membranous and exulcerative processes.

Itching is usually absent; when present and severe it is relieved even before complete restoration of the integrity of the skin.

The course of the disease is either to a slow but complete involution or to the same termination with longer or shorter remissions, but it may terminate in a persistent universal exfoliative dermatitis.

SECONDARY EXFOLIATIVE DERMATITIS.

In this type of cutaneous exfoliation, the morbid process, even though exhibiting many of the symptoms heretofore described under the general title, actually follows in course of time, a precedent generalized psoriasis,¹ eczema, pityriasis rubra pilaris, lichen planus, or possibly a dermatitis medicamentosa, venenata, or traumatica. There may be acute attacks which subside, leaving the original disorder unmodified, or the process may be continued after the first or after successive attacks until a generalized or universal exfoliative dermatitis results, which is clinically and histologically indistinguishable from the conditions resulting from either of the two preceding types of the disease.

In all forms of the disorder, and especially in the last two types, there may be complications due to secondary infection with pus- or other organisms, and to traumatism. In this way moist areas, also pustules, furuncles, and abscesses, may be present from time to time. In such cases local or generalized adenopathy may occur.

PITYRIASIS RUBRA PILARIS.

(LICHEN RUBER [HEBRA]; LICHEN RUBER ACUMINATUS [KAPOSI].
LICHEN-PSORIASIS [HUTCHINSON]; PITYRIASIS PILARIS [DEVERGIE]; *Fr.*, PITYRIASIS RUBRA PILAIRE.)

Pityriasis rubra pilaris is a chronic, mildly inflammatory, exfoliating disease of the skin in which the characteristic lesions are fine, acuminate, firm papules situated at the mouths of the hair follicles and displaying at the apex a horny plug or scale which dips into the follicle. By coalescence the papules form reddened, scaling areas which may spread and cover the entire surface of the body. This affection has been described chiefly in France by Devergie (in 1857), Besnier, Richaud, Brocq, and others. The museum of the St. Louis Hospital is provided with illustrations in wax, of every phase of the malady. Numerous illustrations of the disease have come under the observation of experts in America. The malady is undoubtedly identical with the lichen ruber acuminatus of Kaposi.

Symptoms.—The disease usually begins insidiously, but may appear more or less suddenly, with or without mild systemic dis-

¹ Hoffmann describes a typical case of this character following psoriasis: Hoffmann, *Dermatitis exfoliativa generalisata secundaria* (nach Psoriasis vulgaris), *Zeitschr.*, 1906, xiii., p. 660.

turbance. As a rule characteristic papules ("projecting cones") are not seen until after a period in which the disease appears as a seborrhœa sicca of the scalp, with or without palmar and plantar scaling patches. The disorder may appear first on the face (nose, brow, lips, chin) as a fine pityriasis, or as a condition simulating seborrhœa sicca. A similar fine desquamation may be present on the ears, neck, and other parts of the body, before the appearance of papules, but as a rule the latter appear on one or more regions soon

FIG. 58.



Pityriasis rubra pilaris.

after the first evidence of the disorder and gradually extend to other portions of the body. The scales are seated at the follicular orifices; are thin, whitish, grayish, or heaped up in large discoid masses, are dry, firmly attached, friable, and in cases suggest the "crackle-ware" of the potteries. The disease is usually well marked over the extremities and on the back of the neck, but may involve any or all portions of the body. Occasionally, in the acute type of the disorder, a large number of isolated papules appear somewhat suddenly over several regions, producing a condition simulating goose-flesh.

The characteristic papules are minute, acuminate, hard, dry, and of a color varying from that of normal skin to the different shades of pink, rosy yellow, or duller hues. The papules are situated at the hair-follicles and each is pierced by a hair. At the apex of the papule, and surrounding the hair, is a horny sheath which penetrates

the hair-follicle for a short distance. Fine lanugo-hairs which pierce the papules, may be recognized on close inspection, the whitish horny plugs then giving the lesions a scale-capped appearance.

The papules become more and more numerous, and appear at times to coalesce, and may form patches, at times symmetrically disposed, covered with fine elevations—conical and discrete; or they may become round, flatter, and coalesce so completely as to be lost in the general scaling, exfoliating, erythematous, and lucent area. The yellowish red or deep-reddish patches may be the seat of pityriasic scaling, or may exhibit separation of the epidermis in large, adherent flakes, which, especially over the elbows and the knees, present the appearance of psoriasis. When the infiltration is moderate, the intensifying of the natural lines of the skin is a conspicuous feature. The areas are irregular in size and shape, but frequently have an angular or oblong outline. Commonly at the borders of these patches are found the initial papules of the affection, still isolated and surrounding characteristic stumps, filaments, or black points of hairs, enabling one thus to make the diagnosis with ease.

When discrete papules are grouped closely, and in areas formed by aggregation rather than by complete coalescence of the papules, a "nut-meg grater" effect is produced when the finger is passed over them. At times the eruption is generalized; when the face chiefly is involved, the slight crusts formed are decidedly of the type of those described under *Dermatitis Seborrhoica*. In many cases the tension of the dry infiltrated skin produces ectropion of the lower lid. Occurring over the hairy scalp, the accumulated scales and crusts may form a dense and resisting cap which is difficult to remove. The nails are usually grayish, yellowish, transversely striated, and roughened. There may also be a coincident polytrichia. Important for purposes of diagnosis are the little horny, blackish, conical papillæ occupying the site of the hair follicles on the dorsal surfaces of the first and second phalanges of the fingers. These usually remain distinct even when, on all other parts of the body, their identity has been lost in the general exfoliative process. Sometimes an exceedingly characteristic feature of the disease is displayed in the face, which on inspection seems to be covered with more or less firmly attached, irregularly creased, mortar-like plaster, the "cast" being conspicuously evident over the tip and root of the nose, the lower brow, the lips, and the chin. When the palms and soles are involved, they become the seat of a firm, thick, lamellar hyperkeratosis, reddish-yellow in hue, furnishing a "keratodermic sandal" (Besnier) for the sole.

The course of the disease is usually chronic, irregular, and subject to relapses and to unexpected exacerbations. The disease has a tendency to become generalized, and even universal, and to persist indefinitely. Periods of remission or of complete clearing of the skin are noted in a few instances, but the disorder usually returns. Of the score or more cases that have come under our observation, in

four only have we seen the skin become entirely free from evidences of the disorder, though in most of the cases improvement was noted for varying periods. Of the four cases, in two, after periods of freedom from the disease varying from a few months to five years, the cutaneous symptoms recurred, but not in severe type; in the other two the disorder was acute in its onset, becoming almost universal within ten weeks from its first appearance. In one of these patients who acquired syphilis soon after the appearance of the pityriasis rubra pilaris, the latter disappeared entirely in five months from its onset and had not recurred at the end of 6 years; the other was relieved completely at the end of nine months, but his subsequent history is unknown.

Subjective sensations may be entirely absent, though there is usually a sense of dryness and of constriction of the skin. There may be more or less itching, though as a rule this is not marked. In the earlier stages at least, the general health appears to be unimpaired, even when the disorder is generalized. Eventually, however, in some cases there is more or less failure of general nutrition leading in rare instances to a fatal result.

Etiology.—The cause of the disease is unknown. It commonly begins in the second decade of life, but has been observed at all ages, somewhat more often in men than in women. Cases are reported at the age of two and a half years (Rasch) and at three years (Heller).

Pathology.—Hodara, after histological investigation of two cases, recognized inflammatory changes in the cutis, thickening and infiltration of the capillary blood-vessels, proliferation of the perithelial cells, perivascular increase of the lymph-corpuscles, and mononuclear leukocytes; proliferation and hypertrophy of the connective tissue of the cells of the cutis and papillary layer and slight enlargement of the lymph-vessels of the skin. In the epidermis was well-marked proliferation and hypertrophy of the rete, intercellular and parenchymatous; unmistakable thickening of the horny layer and marked hyperkeratosis of the stratum corneum. Hyperkeratotic horny plugs filled the follicular openings. These horny plugs were thickly distributed over the palms of the hands.

Milian regards the perifolliculitis of pityriasis rubra pilaris as probably due to tuberculosis. He recognizes that the essential feature of the lesion is hyperkeratotic and perifollicular infiltration, the pilary plug being wholly subordinated to the last.

Vignolo, after histological investigation of lesions in a patient forty-six years of age, finds that the epidermal changes are distinctly different from those occurring in lichen ruber. He regards the inflammatory process in the corium as secondary to the epidermal changes. The author also recognized changes in the nerve endings (atrophy of Meissner's corpuscles) and an atrophy-producing sclerosis of the communicating nerves.

Eudokimow agrees with this view respecting the essential differ-

FIG. 1



Pityriasis Rubra Pilaris.

FIG. 2



Pityriasis Rubra Pilaris.



ence between pityriasis rubra pilaris, and lichen ruber acuminatus.

The histopathology given by Jacquet, Hodara, Taylor, Heidingsfeld, Hartzell, Heller and others shows that the papule is the essential lesion of the disease and is formed by hyperkeratosis of the epithelial layer of the superior portion of the hair-follicle. There is also abnormal cornification of the epidermis not limited to the hair-follicles. The mild inflammatory process in the corium is probably secondary to the epithelial changes.

German cases (under the name of lichen ruber acuminatus) have been studied by Hebra, Kaposi, Neumann, Biesiadecki, Joseph, and others. The different reports vary considerably, depending apparently upon the age of the lesions examined. The morbid process corresponds closely to that described above, except for a more pronounced inflammation in the corium, as a result of which Kaposi and others believed the epithelial changes to be secondary to an inflammation of the corium.

Diagnosis.—The disease is to be differentiated from all others by the characteristic papule pierced by the shaft, or segment of shaft, of a hair. In extensive cases of long standing the identity of the papules may be lost in the general desquamation over most of the body; but in nearly all cases lesions can be recognized on the backs of the fingers, as described above. From lichen planus the diagnosis is not difficult in the early stages or when individual papules are found bordering the larger areas. The dull-crimson or violaceous hue of patches of lichen planus, is characteristic. Moreover, the disease is rarely so generalized as pityriasis rubra pilaris. Keratosis pilaris is limited, as a rule, to the regions which it chiefly affects, the extensor faces of the limbs. Ichthyosis is commonly congenital, the first lesions developing soon after birth. In psoriasis the characteristic silvery-white imbricated scales, the bleeding points beneath, and the larger size of the primary lesions will usually establish the diagnosis. In pityriasis rubra (of Hebra) the history of the disease, the absence of distinct papules and of infiltration, and the appearance later of atrophy of the skin are distinctive features. It must be remembered that rarely pityriasis rubra pilaris may terminate in a generalized exfoliative dermatitis which cannot be distinguished from the same process arising from psoriasis, eczema, or other scaling affections (see *Dermatitis exfoliativa*).

Treatment.—Systemic treatment should be varied to meet the indications in each individual. In many cases tonics, cod-liver oil, and an especially nutritious diet are indicated. Crocker praises thyroid extract, beginning with five grains (0.33) gradually and continuously increased. Arsenic has given excellent results in some cases, but in a large number has failed; and apparently in a few instances has aggravated the disorder. We have had marked amelioration of the symptoms following the combined use of arsenous acid, grain $\frac{1}{20}$ (0.0033), and protoiodide of mercury, grain $\frac{1}{4}$ (0.01), three times a day, combined, however, with external applications.

The local treatment corresponds closely to that of psoriasis, squamous eczema, and other exfoliative conditions. The daily use of an ointment containing from 5 to 20 grains (0.33–1.30) of salicylic acid to the ounce (30.) of vaselin, or of equal parts of vaselin, lanolin, and olive oil, is often of value in keeping the skin soft and relieving the itching when present. For markedly thickened areas, ointments containing salicylic acid in strength of from 20 to 60 grains (1.33–4.) or more to the ounce (30.) may be used; or some of the preparations of chrysarobin, resorcin, oil of cade, or ichthyol recommended for the treatment of psoriasis. Fatty crusts, when these are abundant, are to be removed by shampoos as in seborrhœal affections of the scalp.

Prognosis.—The prognosis is unfavorable with respect to the cutaneous manifestations, as in those cases in which the disorder disappears temporarily, it almost invariably recurs. The tendency of the disease is to persist indefinitely. The general health may be unimpaired, but is affected sooner or later in many instances. The issue in exceptional cases may be fatal.¹

LICHEN RUBER.²

(Gr., *λειχήν*, moss.)

(LICHEN RUBER ACUMINATUS. Ger., ROTHE SCHWINDFLECHTE.)

Under the term lichen ruber, Hebra was first to describe a disease which corresponds closely to the disorder described in these pages as pityriasis rubra pilaris. All of Hebra's cases, however, were associated with grave systemic conditions and terminated fatally. Kaposi later described a *lichen ruber acuminatus* which he states is identical with the lichen ruber of Hebra, though in his cases the general health of the patient is not so seriously affected. The exact relationship existing between the cases described under these three titles has been the subject of much discussion, but at an International Dermatological Congress, a case was claimed as typical lichen ruber acuminatus by Kaposi and other Germans and as typical pityriasis rubra pilaris by different French authorities. Critical comparison of the literature and illustrations of the subject removes all

¹ Bibliography: Besnier, Annales, 1889, s. ii., pp. 253, 398, 485; Richaud, Thèse de Paris, 1877; Thibierge, La Prat. Derm., 1902, T. iii., p. 886; Taylor, N. Y. Med. Journ., Jan., 1889; Brocq, Annales, 1889, s. ii., x., p. 301; Rasch, Centralb., 1899, ii., p. 199; Heller, Zeits., 1903, x., p. 153 (with histological study); Milian, Annales, 1906, s. iv., vii., pp. 1067–1075; Vignolo, Archiv, 1906, lxxix., pp. 273–292, Eudokimow, Russi. Zeits. f. Haut- und Vener. Krankheit., 1905, Bd. 9.

² Literature bearing on the subject: Discussion in Trans. Internat. Cong. of Derm. and Syph., Paris, 1889; Besnier, Annales, 1889, s. ii., x., p. 322 (monograph, with colored illustrations and full discussion of entire question); Kaposi, Archiv, 1889, xxi., p. 743, and 1895, xxxi., p. 1; Robinson, J. C. D., 1889, vii., p. 41 (with colored illustrations); Taylor (R. W.), N. Y. Med. Jour., January 5, 1889, p. 1 (with histology); Neisser, Verh. d. deutschen Derm. Gesell., IV. Cong., p. 495 (with discussion); Hans v. Hebra, B. J. D., 1890, ii., p. 65; Neumann, Archiv, 1892, xxiv., p. 3; Verh. d. Berlin. Derm. Gesell., 1901–2, p. 118; and discussion before N. Y. Derm. Soc., J. C. D., 1902, xx., p. 572.

doubt that pityriasis rubra pilaris and lichen ruber acuminatus (Kaposi) are one and the same disease. Hebra's lichen ruber, judging from Kaposi's statements and from two plates (to which Crocker calls attention), published by Hebra, was probably a severe form of the same disease.

A few German authorities still teach that pityriasis rubra pilaris is wholly distinct from lichen ruber, which they subdivide into lichen ruber acuminatus and lichen ruber planus. Instances are cited by Kaposi, Neumann, and others, in which the acuminate and the plane papules coexisted in the same individual. These few cases are probably coincidences or modifications of usual types, and lichen planus is held generally to be a disease entirely independent of lichen ruber.

LICHEN PLANUS.

(Gr., *λειχάνη*; Lat., *planus*, flat.)

(LICHEN RUBER PLANUS, LICHEN PSORIASIS.)

Lichen planus is an inflammatory dermatosis, in which are displayed multiple, small, flat-topped, angular or polygonal papules, often exhibiting a color containing various shades of crimson or purple, the plane apex of each being usually flat or depressed and

FIG. 59.



Lichen planus.

covered with a horny film. This disease was described first by Erasmus Wilson in 1869, and although in typical development its distinctive features are pronounced, much discussion has existed regarding its relation to lichen ruber acuminatus (Kaposi). Under the latter title the reader will find paragraphs devoted to this discussion. The disorder is of frequent occurrence, though it is not

one of the common diseases of the skin. It is usually chronic, but may be acute, and although in most instances limited in distribution it may be extensive and even generalized.

Symptoms.—In a typical case of lichen planus the primary lesions are pin-point- to pin-head-sized, angular or polygonal, flat, papules. These are sharply defined, and covered not with a scale, but with a thin, translucent, horny film, which gives the lesions a waxy

FIG. 60.



Lichen planus. (Fox.)

or varnished appearance. As the papules increase in size they retain their angular or polygonal outline and remain flat, or may become slightly umbilicated. The bases are rounded or angular and the sides precipitate. The color of recent lesions is a bright crimson, that of the older a dull crimson or reddish purple. The greatest diameter attained by any individual papule is about one-half that of a small split-pea, but by coalescence the original lesions may form larger areas which are also angular, linear, or polygonal in outline, and are defined sharply from the surrounding skin. On the patches the thin horny covering may partially be broken up into very fine, closely adherent scales. The surface may show fine white striæ. The favorite sites of the disease are the flexor surfaces of the wrist and forearm, and the legs immediately above the ankles, though any part of the body may be involved. Itching is usually intense and rarely absent though in some cases it is much less severe than in others.

The elementary lesion of every classically developed eruption is a flat-topped or slightly umbilicated, angular or polygonal, slightly elevated, sharply outlined papule, which when studied in different positions so that the light falls aslant upon the surface, exhibits a characteristic glistening or shining top shown in no other eruption. On the surface of larger papules may be seen, on close inspection, minute whitish points and lines to which Wickham first called attention. The papules exhibit a peculiar crimson or purplish shade,

and when the eruption is plentiful this color is so characteristic that by it alone in a well-marked case the eruption may be recognized by the eye before individual lesions can be identified. The papules vary in size from that of the head of a small pin to one-half that of a split-pea. Rarely they may be larger, or round instead of angular, or an occasional papule may enlarge peripherally to form a circle half an inch or more in diameter with depressed centre.

As the lesions grow older they almost invariably distinctly deepen in shade, from a light-crimson to a dull-purplish hue, and still later to even a darker color. Involution of the papules often leaves a pigmentation of a smoky, sepia, or even blackish hue, which is naturally most conspicuous and most persistent on the lower extremities. Occasionally white, atrophic-looking spots are left, which ultimately disappear.

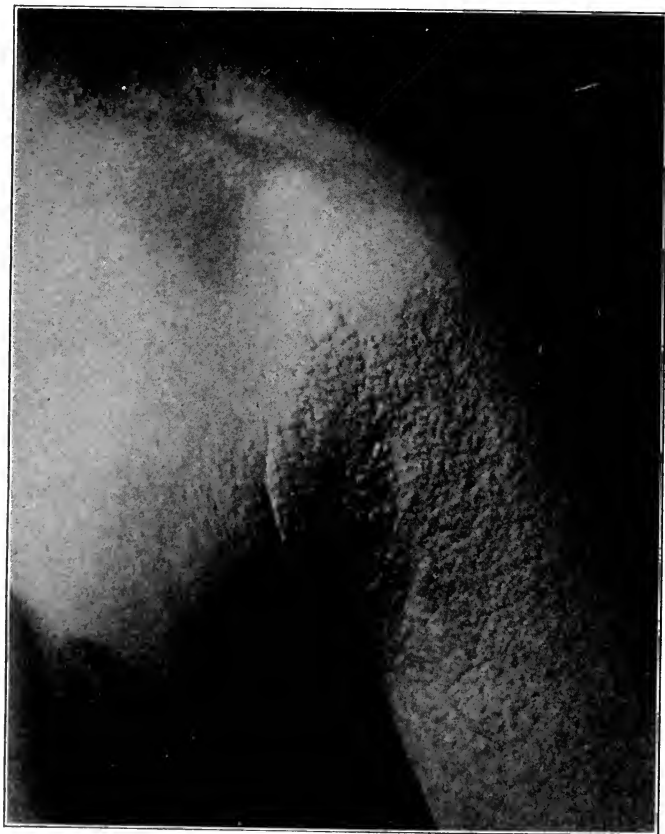
The lesions may be discrete and isolated, or irregularly grouped, but when numerous they tend by multiplication and aggregation to form irregular, linear, angular or polygonal patches with sharp outlines. Annular or circinate patches may occur (*Lichen planus annularis*). Rarely combinations of lines and circinate groups form exceedingly odd-looking figures, parallel lines, cockades, scaling crests, rings, rosettes, etc. The shape of the patch may be determined by an external irritation, such as a scratch-mark.

When the papules coalesce and lose their identity, a crimson-hued sheet or mask of the skin is seen, generally characterized not merely by the color of the lichen-papules, but also by a silvery sheen, due to thin shining scales which do not completely cover, but which supplement, as it were, the empurpled patches, beside and over which they form. These scales are not freely shed from the surface, but are attached firmly. When there are decided sheets of infiltration they are most conspicuous over the flanks and belly, but they may also be seen elsewhere, as, for example, over the extremities. When the patches undergo involution, the scaling ceases, the infiltration subsides, and the intensely deep pigmentation left is characteristic of the disease, being often of a smoky, and even of a blackish hue. Later slight atrophy may appear for a time, but permanent scarring is seen rarely if ever. After the disease has existed for a long time, a single band-like plaque may lose almost all papular features, and come to resemble a deep-purplish keloid-like elevation or flat tumor imbedded in the skin; more commonly the majority of the papules are lost in the formation of flat-topped, brownish-red, pea- to bean-sized or larger elevations commingled with sepia-brown pigmented spots (*lichen planus hypertrophicus*). Such nodes, ridges, or patches may be elevated one-fourth of an inch or more above the level of the skin, and may be covered with adherent horny scales or with pointed horny projections which give the lesions a warty appearance (*lichen planus verrucosus*). The hypertrophic forms in moderate development may be seen occasionally about the

genitals as a result of long-continued infiltration and traumatism from scratching.

The disease, though usually limited to a few regions, is symmetrical as a rule, but may appear on one side only of the body. The eruption may cover large areas, and in rare instances the entire surface of the body. The favorite sites are the flexor surface of the wrist and forearm, and the leg below the knee. The disease may appear on any part of the body, but is seen rarely on the face or scalp, and is unusual on the palms and soles.¹ The nails may be involved and present lesions similar to those seen in psoriasis and eczema.

FIG. 61.



Lichen ruber moniliformis.

The greatest variation is experienced in the way of subjective sensations. In some patients the eruption is tolerated with but few symptoms of annoyance. In other patients the greatest possible distress is occasioned, and no subjects of scabies or of eczema suffer more. The eruption of lichen planus, however, is scratched less

¹ Cf. Dubreuilh and Le Strat, *Annales*, 1902, s. iii., iii., p. 209.

often than that of other cutaneous exanthemata accompanied by severe pruritus.

The course of the disease is chronic, and when untreated it may last for months or years, either through persistence of the original papules and areas, or, what is more frequent, by the successive appearance of new lesions. Occasionally the disease disappears spontaneously but its tendency is to persist. The disease may recur, but recurrence is an exception to the rule.

Rarely lichen planus may begin as an acute exanthem, becoming generalized in a few days, or even within twenty-four hours. In such cases the lesions are usually minute, of bright color, and exhibit no tendency to definite grouping. There may be coincident febrile symptoms and mild systemic disturbance or severe concomitant disorders such as pemphigus, diabetes, syphilis, and grave ulceration.¹ These acute symptoms may develop in individuals previously free from all evidence of lichen planus, but more commonly in those who have exhibited for months or years one or more areas of the disease, which then may run an acute course of a few weeks yielding readily to treatment or may persist as a generalized or localized chronic form.

As a rule the general health is not involved save when the itching is so severe as to interfere with the patient's sleep and rest. Crocker refers to generalized cases in which the health was affected profoundly, a few of which terminated fatally. In this country one such case has been reported by Fordyce,² but it is not clear that the severe systemic disorders present in these cases have had any direct relation to the lichen planus.

A number of variations from the usual clinical types occur.³ On the legs and forearms, and occasionally on other parts of the body, rounded or oval, flat or slightly convex papules may develop to the size of a pea or bean (*lichen planus obtusus*). Kaposi, Gunsett,⁴ and others report cases under the name of *lichen ruber moniliformis* in which numerous node-like masses are arranged in lines and bands resembling a necklace of beads, with flattish, punctiform papules, and macules of a sepia-brown hue between the nodes.⁵ When the lesions especially over the lower extremities have existed for some time, they may become elevated, warty and verrucous, losing their earlier smooth aspect (*Lichen planus verrucosus*).

The tendency of lichen planus papules to form linear groups, or bands may be exaggerated to produce the type known as *lichen planus linearis*.⁶ In such cases a narrow fillet of typical lesions may extend from the heel to the trunk along the line of the sciatic

¹ Johnston, J. C. D., 1907, xxv., p. 86; Galloway, B. J. D., 1906, xviii., p. 66.

² Trans. Amer. Derm. Assoc., 1898.

³ Crocker, B. J. D., 1900, xii., p. 421 (with discussion before the London Dermatological Society).

⁴ Archiv, 1902, lx., p. 179 (with histological report and bibliography).

⁵ A case of "moniliform lichen ruber" was shown by the author to the Chicago Dermatological Society in the year 1908.

⁶ Cf. Heller, Archiv, 1898, xlii., p. 59, and Whitfield, B. J. D., 1906, 18, 221 (with references to previously published cases of this type).

or other nerve, or, more frequently, from the buttock to a few inches below the knee. Such a case recently came under our observation. A similar arrangement of lesions may occur along the course of the nerves of the upper extremity or on the trunk. Again, the bands may be absolutely straight and apparently independent of the course of any nerve. Galloway has reported a striking example of this type,¹ and we have had a similar case, but less extensive, on the outer surface of the thigh and leg.

Vesicles at the summit of some of the papules, and bullæ occur in a number of cases of lichen planus, most frequently in patients who have been taking arsenic, but also in others who had taken no arsenic prior to the appearance of the moist lesions. Trautmann² has described a case in which pemphigus appeared to follow an attack of lichen planus. Whitfield,³ in presenting a patient, analyzed seventeen previously reported cases, in nine of which the patient had taken no arsenic prior to the appearance of bullæ. He states that the presence of bullæ apparently has no bearing on the severity or prognosis of the disease.

Under the title *Lichen Planus Erythematosus*, Crocker describes two cases in which the papules were of a deep-crimson tint, soft to the touch, and obliterated temporarily by pressure. There was in both a marked telangiectasis of the face. Crocker mentions a similar case reported by Stirling.

Lichen planus is of rare occurrence in children. Crocker, Livering, and Colcott Fox all report a spurious form which the author first named believes to be a subsiding stage of papular or vesicular miliaria rubra. In Whitfield's case of linear lichen planus, the patient was a child aged 6½ years. The lesions in children are much like those in adults.

Etiology.—The causes of lichen planus are obscure. It is often difficult to recognize the sources of the disease, but in many cases a history of nervous exhaustion can be obtained. One of our patients, a married woman, displayed the disease in an aggravated form almost immediately after the body of her husband who had been burned to death was brought to her door. Grief, long-continued anxiety, and overwork, especially when accompanied by great mental strain, frequently precede this disorder. Many patients are well nourished and not lacking in flesh. In fact, the combination of a fair degree of nutrition of the body with nervous exhaustion is to be recognized frequently in patients affected with lichen planus.

Other causes cited are: traumatism (dog-bite, Walters), digestive disturbances, malaria, malnutrition, and diseases of the generative organs. Lichen planus is most common after the second decade of life, and is rare in children. Different opinions are entertained

¹ B. J. D., 1900, xii., p. 206.

² Derm. Zeitschft., 1906, 307.

³ B. J. D., 1902, xiv., p. 161; see also Allen, J. C. D., 1902, xx., p. 260 (report of two cases with reference to others previously recorded and discussion before Amer. Derm. Assoc.).

respecting the frequency with which men and women are attacked. General experience points to the conclusions formulated by Crocker, who reports more cases among (English) women than among men, while the statistics of the Vienna school reverse the figures. The disease is encountered more frequently in private practice among the nervously taxed of the well-to-do classes than among out-patients of public charities, who suffer to a greater extent than others from cachexia and malnutrition. Russell lately reported a case in which the disease followed amputation of four fingers of the right hand. Hoffmann¹ reports the coexistence of lichen planus with diabetes.

The fact that lesions develop along scratch-lines in predisposed individuals leads Jacquet to state that lichen planus is always traumatic, and found in individuals with a diminished vasomotor tonus, resulting from some disturbance of the nervous centres. Hallopeau and Jomier,² on the other hand, bring forward as evidence of the parasitic origin of the disease a case in which lichen planus lesions developed along scratch-marks in an individual who had never had the disease. A similar case is reported by West³ in which the scratch-marks were produced by a cat.

Pathology.—Robinson first clearly showed the pathological distinction between lichen ruber and lichen planus. His observations have been confirmed by those of Boeck, Kaposi, Touton, Weyl, and others. Among reporters on the histopathology of the disease may be mentioned Crocker, Török,⁴ Joseph,⁵ and Pinkus.⁶

The genesis of the disease, though not understood, is probably neuropathic. Colcott Fox suggests a neuroparalytic hyperæmia as the first stage of the process. The corium shows dilatation of the vessels, œdema, and cell-infiltration which is limited to the papillæ and to the subpapillary layer, where it is defined sharply from normal tissue beneath. This sharp definition is characteristic of the process. The papillæ usually are enlarged. The cells are reported by some observers to be leucocytes; by others as of connective-tissue origin. It is probable that in the early and acute stages leucocytes predominate. In some instances polymorphonuclears are conspicuous, while new connective-tissue cells will be found in lesions of longer duration.

The epidermal changes also vary considerably according to the stage and acuity of the process. In acute cases with much infiltration of the corium the rete may be thinner than normal as a result of pressure. There is often, however, early in the process more or less hyperplasia and intercellular œdema of the rete. Unna states that the epithelium shows first a hyperplasia of the prickle-cells with intercellular œdema, increase in the granular layer, and hyperkeratosis of the horny layer. As the papule enlarges the centre shows an atrophic

¹ *Annales*, 1906, s. iv., vii., p. 420.

² *Annales*, 1903, s. iv., iv., p. 352.

³ *B. J. D.*, 1897, ix., p. 162.

⁴ *Jour. mal. eutan.*, 1889, s. 6, i., p. 162 (with bibliography).

⁵ *Archiv.*, 1897, xxxviii., p. 3.

⁶ *Ibid.*, 1902, lx., p. 163 (3 plates and references to literature).

thinning of the rete and a more compact horny layer which, resting upon the flattened rete, gives the papule its umbilicated aspect. The density of the horny layer covering the papule gives the latter its glazed appearance and explains the lack of exfoliation in scales.

The process frequently begins about the ducts of the coil-glands, though the glands themselves rarely are involved. The hair-follicles and sebaceous glands also escape.

Crocker states that the greatest thickening of the horny layer occurs at the centre of the papule at the opening of the sweat-duct into which the horny mass projects, and that the desquamation of this plug leaves a depression or umbilication of the papule.

Joseph,¹ Whitfield, and others have reported the formation of small vesicle-like cavities in the basal layer. Joseph explains the umbilication of the papule by absorption of these pseudo-vesicles.

Diagnosis.—The diagnosis rests upon the characteristic features heretofore described. Thus, in its size, apex, color, and course the papule of papular eczema is quite different from that described above, being brighter, redder, more acuminate at the apex, and much more often followed or accompanied by catarrhal symptoms in the skin. In psoriasis punctata the scales are abundant and readily removed; the individual lesions are increased rapidly by peripheral extension, far beyond the fullest development of the papule of lichen. The papular syphiloderm is not, as a rule, pruritic, not flattened when minute, not polygonal in shape, and not covered with a closely adherent horny scale, and it always occurs in patients in whom careful investigation discloses other symptoms of the disease (mucous patches, adenopathy, etc.). The history and course of the disease will determine the diagnosis.

Chronic lesions of lichen planus on the legs (obtuse, verrucous, hypertrophic) have been confused with the condition of the same parts developed in Kaposi's multiple idiopathic pigmented sarcoma. In the disorder last named, the elephantiasic aspect of the limb, the infiltration of the integument, especially at the root of the toes, and the characteristic roundish nodules springing from the general surface, suffice to render the diagnosis facile.

The distinctions noted above in connection with lichenification of patches of chronic inflammation of the skin are not to be disregarded.

Treatment.—Systemic treatment depends upon the condition of the patient. As many of the subjects of lichen planus are neurotic, neurasthenic, or suffering from other depressing or debilitating conditions, it follows that in many instances it is necessary carefully to regulate the diet, habits of rest, sleep, and exercise, and to administer tonics, cod-liver oil, and other remedies which will build up the general health. In some instances a change of climate, scene, and occupation is of the greatest value.

Arsenic, though sometimes causing an aggravation of the symptoms in acute cases, is a valuable remedy in many subacute or chronic

¹ Loc. cit.

and extensive cases of the disease. It may be given as directed for the treatment of psoriasis. Mercury in the form of the biniodide, bichloride, or the protoiodide, is increasingly recognized as of unquestioned value in many cases. The protoiodide, grain $\frac{1}{6}$ (0.01), with or without arsenous acid, grain $\frac{1}{20}$ (0.0033), may be given three times a day. Crocker recommends the use of salicin in 15-grain (1.0) doses three times a day and large doses of quinine in an effervescent mixture. Tilbury Fox and Robinson found the alkaline diuretics taken well diluted after meals of value, especially in the generalized hyperæmic cases. For very acute cases we have found the remedy of value at times in relieving excessive itching. Aspirin in 5-grain (0.33) doses may be used for the same purpose. Hartzell¹ advocates the employment of the salicylates.

Local treatment should be directed toward the protection of the skin and the relief of itching. For many cases the use of a paste and dusting-powder as described in the treatment of eczema and psoriasis gives satisfactory results. A paste containing equal parts of lanolin, vaselin, zinc-oxide, and talcum, with from 1 to 3 per cent. of salicylic acid, is usually effective. In very acute and extensive cases more relief sometimes is obtained by the use of the soothing lotions and dusting-powders recommended for the treatment of the acute stages of eczema. The same care should be taken as in eczema to have the clothing next the skin of soft cotton or linen. In many instances bathing once a day in tepid oatmeal- or bran-water, with or without the addition of an alkali, may precede the application of the paste or other remedy. Some patients, especially those with much scaling and infiltration of the skin, are made more comfortable with the use of ointments than with pastes. In subacute and chronic cases tar in the form of lotion, ointment, or paste, is often of value. Directions for its use are given in the section on eczema. For stubborn patches the treatment differs little from that recommended for inveterate psoriasis. For hypertrophic areas, salicylic acid is most effective. It may be applied in a paste or ointment containing from 30 to 60 grains (2-4.) to the ounce (30.), or better, it may be dissolved in equal parts of alcohol and ether, and the solution painted on the patch. The alcohol and ether evaporate and leave the acid in contact with the lesion. After a sufficient amount has been applied, the whole may be covered with adhesive plaster. The dressing should be changed every day or two, and when the part becomes greatly inflamed a soothing dressing should be substituted. Brocq and Jacquet recommend the daily use of a tepid douche for from two to ten minutes at a time, alternated with the application for a few seconds of a cold spray.

For chronic cases with much infiltration, the x-rays are indicated. We have used the method, in conjunction with other treatment, in a large number of cases with decided improvement, including relief of itching in all, and unusually rapid recovery. The number of exposures in each case varied from two to nine, and the technique was that commonly employed for psoriasis.

¹ J. A. M. A., July 20, 1907, 225.

Prognosis.—The prognosis is in general favorable, since even cases of long standing usually are relieved when the subjects of the disease are placed under conditions favorable for recovery. When the patient is neurasthenic the eruptive symptoms may persist for years, accompanied by intense itching and a consequent teasing of the nervous centres. In this class of subjects it is generally well to make a guarded prognosis, and to pronounce upon the future with reserve.

LICHEN PLANUS ANNULARIS.

In some cases, the papules of lichen planus, while extending peripherally, leave a cleared or clearing centre, and form thus circular patches in thin rings or bands, at times coalescing in polycyclic outlines. The patches may be few or numerous; the rings, faintly or very distinctly outlined; the component parts of the ring, the characteristic papules of lichen planus, either readily distinguishable or so fused as to render their identification difficult.

Wholly different from this condition is that denominated *Granuloma Annulare*—designated by some authors as *lichen annularis*—the paragraphs devoted to which in this treatise may be compared with the preceding pages. It is true that some authors believe the conditions named are, if not identical, at least allied; but our experience (cited by Graham Little who has studied the subject exhaustively) leads the author to believe that the essential lesion in each is not the same.

It is rare that the classical papule of lichen planus is to be recognized in typical granuloma annulare: this last occurs in children, but also often in gouty patients in middle or later life. The lesions are disposed on the hands chiefly (lichen annularis is more often displayed on the trunk). The individual elements in granuloma annulare are smooth, flattened nodules rather than papules; pale, ivory-like or slightly reddened. When fused the annular patch is elevated one or two millimetres above the general level of the skin. The fused ring is firm, distinctly circumscribed, the skin of the enclosed area having a normal aspect, at times suggesting that superficial atrophy has taken place.

LICHEN PLANUS MORPHÆICUS.

LICHEN PLANUS SCLEROSUS ET ATROPHICUS (Crocker and Stowers).—This is one of the rarer forms of lichen planus, the lesions in their size, shape, firmness, evolution, and grouping, not greatly differing from the more common types. The papules are, however, somewhat whiter than others and differ also in the prominence of the horny plugs projected from each. After the casting of the plug the papule undergoes at its depressed centre a distinct atrophy, while in some a narrow reddish or pigmented zone produces a picture strikingly suggestive of morphœa, whence the title given the lesions by Crocker.

Montgomery and Ormsby, however, have distinctly differentiated the two disorders from "White Spot Disease" (*morphœa guttata*).

Dubreuilh has called attention to a point of striking import in this connection, viz., that a group of dermatoses variously denominated by authors, lichen morphœicus, circumscribed guttate sclero-

FIG. 62.



Lichen planus atrophicus.

dermia, circumscribed cutaneous atrophy, atypical lupus erythematosus, "*vergetures rondes*," etc., may be, one or all, examples of atrophic and sclerous lichen planus.

In typical cases the papules are grouped, six, eight or more in a single cluster, the individual elements being smooth, shining, whitish or rose-reddish, slightly elevated, faceted at the sides, striated finely at the summit, firm, dry, and plugged, each with a horny central mass. These even at a short distance resemble comedo-plugs, being blackish points, of which at the summit of a single lesion, as many as five or six may be seated each in a distinct depression in the integument.

Histologically, these lesions do not differ from those of the usual type of the disease, save that the areas of cellular infiltration are rather more deeply seated and separated from the overlying epiderm by a layer of distinct sclerotic tissue. Montgomery and Ormsby taking the broad view of these conditions, believe that a close relationship exists between the atrophic forms of lichen planus, and *morphœa* as well as the macular and striate atrophies of the skin.

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LICHEN SPINULOSUS.

(LICHEN PILARIS.)

Under the titles named above Radcliffe-Crocker, Adamson, Bowen, Pringle, and others have described a condition in which filiform spines are developed from lesions of lichen planus, usually in symmetrical disposition, occurring more often in boys and children than in adults. Somewhat more than a score of cases have been observed. Horny plugs or spines, giving to the finger the sensation of touching a nutmeg grater, some of them with flattened tops, occur in groups upon patches of the skin which are infiltrated and indurated. The papules from which the spines project are usually miliary or acuminate, and situated at the pilo-sebaceous follicles, occurring on the face (forehead), neck, ears, and extremities, thigh, leg, and upper and lower arms, and in some cases commingled with the ordinary lesions of lichen planus; in some others with papules suggesting keratosis pilaris; yet other cases are associated with patches of lichenification. The papules are sometimes lighter colored; at times of a dark brownish hue, and in cases they are interspersed with dull, red maculopapules. Often a hair may be seen piercing the separate lesions. The eruptive symptoms are to be distinguished from those occurring in Hallopeau's *acné cornée*; from *pityriasis rubra pilaris*; from lichen *scrofulosorum*; and from the miliary *syphiloderm*.

In Brooke's *keratosis follicularis contagiosa*, delicate horny spines have sometimes been recognized and the distinction between these last and the disorder under consideration may be difficult, if at all possible, to establish.

Pathology.—Histological examination of the plugs establishes the fact that they are made up of concentric lamellæ cylindrically disposed about an atrophied hair. The horny masses are made up of welded flattened epithelial cells. The walls of the containing plug are thinned toward the follicular orifice, and widened below where there is *acanthosis*. There are no keratohyalin granules; no sebaceous glands; the sweat glands are not attacked, and the hair bulb is unaltered.

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LICHEN ANNULARIS.

Lichen annularis (ringed eruption of the extremities) is a title given by Galloway¹ to a case in which several lesions having pale, irregular, elevated borders showing circular or circinate outlines, de-

¹ B. J. D., 1899, xi., p. 221 (with clinical (colored) and histological plates, and abstracts of similar cases previously reported).

veloped about the joints of the hands. The border was elevated one or two millimetres; the lesion was about three millimetres in breadth; smooth, hard; and not reddened, but suggesting deep-seated infiltration of the cutis. The folds of the skin about the joints divided the border in places, giving it a nodular appearance. The lesions were slow of evolution and indolent in career. The skin of the enclosed area was almost sound, but showed slight signs of atrophy when the original process had undergone involution. The histological structure closely resembled that of lichen planus. The lesions flattened rapidly under the application of salicylic acid in ointment. We have had similar cases. The lesions were limited to the forefinger and thumb of one hand, and entirely disappeared in the course of a year under somewhat irregular treatment with a 50 per cent. aqueous solution of ichthyol, after salicylic acid had been used several months without effect. Crocker¹ describes five similar cases and refers to others reported.

LICHEN PLANUS OF THE MUCOUS SURFACES.

Lichen planus of mucous surfaces² (tongue, inner face of the cheeks, lips, epiglottis, glans penis, progenital region of both sexes, anus and peri-anal region) may occur without cutaneous symptoms, or accompany these last. In some cases of well-marked cutaneous disease the mucous membranes are so slightly affected or attract so little attention that they are overlooked. Dubreuilh believes that more cases of involvement of mucous membranes occur without cutaneous lesions than of the last named without mucous symptoms. Confusion has been bred in these cases by the hastily formed conclusion that the lesions here discussed are mucous patches or symptoms of leukokeratosis buccalis.

Pinhead to hemp-seed sized, grouped or isolated, slightly projecting, velvety, smooth, grayish, whitish, rounded, projecting lesions may be recognized as lesions of lichen planus of the mucous surfaces, the color and size varying somewhat with the individual, the age of the disorder, and the locality involved. Sometimes a slight halo surrounds the base of each; at times they are firm, at others soft to the touch. Again they may send short ramifying striæ to the neighboring mucous surfaces. As distinguished from purely cutaneous lesions they may be smeared with a whitish mucus. Histologically the picture does not greatly differ from that recognized in sections of nodules removed from the skin. The principal focus of disease is found in the papillary and sub-papillary layers of the corium, where

¹ Diseases of the Skin, 3d Ed., p. 1082.

² Literature: Neumann, *Über die Localisation des Lichen planus auf der Schleimhaut*, *Weiner med. Wochenschr.*, 1906, 17; *Archiv*, 1906, lxxxii., p. 469. Poor, *The Anatomy of Lichen Planus of the Mucous Membranes*, *Derm. Zeitschr.*, 1905, xii., pp. 605, 645; B. J. D., 1906, xviii., p. 227; *Annales*, 1906, s. iv., vii., p. 421; *Monatshefte*, 1905, 41, p. 623; *Archiv*, 1907, lxxxvi., p. 364. Dubreuilh, *Histologie, Lichen Plan des Muqueuses*, *Annales*, 1906, s. iv., vii., pp. 123-129 (list of cases). Vörner, *Ombilication dans le Lichen ruber plan de la muqueuse*, *Zeitschr.*, 1906, xii., p. 107; *Annales*, 1907, s. iv., viii., p. 145.

a mass of lymphoid cells with a few polynuclear leucocytes compose the infiltration. The blood-vessels are relatively "respected" and the usual elongated rete-pegs pass below, at times branching, into the interpapillary hyperplastic mass.

LICHENIFICATION.

This term was applied first by Brocq and Jacquet to areas, usually limited and circumscribed, in which the skin is reddened, infiltrated, and more or less covered with fine scales, but in which the marked feature is an intensifying of the normal lines and furrows of the skin, as a result of which the patch is broken into small, more or less elevated, triangles, squares, or quadrilaterals which closely resemble the flat, angular papules of lichen planus. This condition of lichenification is seen in the subsiding stages of various forms of dermatitis, and also in areas that have been subjected to mild but long-continued scratching or other external irritation. The disorder is seen most frequently about the flexures of the joints, the fork of the thighs, and the back of the neck, but may appear on any part of the body, and is sometimes quite extensive. The condition usually disappears promptly under protective and antipruritic treatment, but shows a marked tendency to recur.¹

IMPETIGO.

(Lat., *impetere*, to rush upon.)

(Ger., EITERFLECHTE; Fr., IMPÉTIGO, DARTRE HUMIDE.)

The various forms of impetigo described by older writers are now otherwise classified, leaving impetigo contagiosa as the only form of the disease having this title.

Impetigo Contagiosa.—(*Porriigo Larvalis*, *Porriigo Contagiosa*, *Pemphigus Acutus Contagiosus Adultorum* (*Pontoppidan*).) This is one of the common forms of skin-disease. The first lesions are one or a few discrete vesicles or pustules which are transformed so rapidly that they are not usually seen before crusting. In most cases the lesions are located on the face and ears and in children on the scalp, sometimes on the neck and hands; rarely on other parts of the body.

The lesions present are yellowish, gummy-like crusts, which through admixture with blood may be blackish. These crusts seem to be pasted on the skin; they extend somewhat beyond the borders of the surface they cover; their edges are sometimes slightly curled upward. Underneath the crusts there is a superficial erosion having

¹ For full discussion of the subject, see Brocq's chapter on "Les Lichens," *La Pratique Dermatologique*, t. iii., p. 119.

a distinct outline. Erosions free from crusts, presenting simply a weeping surface occur with the other lesions. The lesions not over pea-sized in the beginning, attain the size of a penny. There is sometimes a sprinkling of bright red papules. In a given case lesions are seen in all stages and these may become confluent. In children pustular lesions of the fingers are not uncommonly associated with impetigo of the face; and stomatitis is observed from time to time. Dark erythematous areas remain after the disease has disappeared, gradually fading without the production of scars. Permanent scars in some cases are left by impetigo contagiosa of the scalp.

FIG. 63.



Staphylococci, superficial type.

Impetigo Contagiosa Gyrata.—This is a clinical variety of the disease in which the lesions spread in a serpiginous manner so as to form circles.

Impetigo Contagiosa Bullosa.—In adults this form of the disease is observed only after vaccination, but in infancy it is not uncommon.

The eruption described as *Pemphigus Neonatorum* is one form of this affection.

Symptoms.—The disease occurs largely in the summer months. The eruption begins as one or two bullæ which are not surrounded by areolæ of redness. They rupture quickly, leaving coin-sized, sharply defined areas of excoriated surface, which multiply rapidly

FIG. 64.



Impetigo contagiosa.

until the entire part affected is covered with denuded areas to the borders of which shreds of epidermis are attached. In hospitals this disease spreads from one infant to another with great rapidity and in spite of all precautions.

The several clinical pictures differ on account of the greater or lesser diffusion of the contagious elements in each case; for example, there may be a few isolated pea-sized and larger vesico-pustules on a single hand; or many may be clustered about the mouth and lips; or dense greenish crusts may succeed such lesions over occiput or scalp; or there may be much larger pustulo-bullous elements over the legs, torn, scratched, and thickly covered with pustular or hemorrhagic incrustations. In rare instances circinate, annular, gyrate, serpiginous, herpetic, variolaform, and even pustulo-crustaceous lesions have been observed. The disorder is not often seen in private prac-

tice, but in public patients it occurs among the cachectic, the filthy, and the neglected. The several types of impetigo described as staphylogenes, streptogenes, circinata, etc., have no distinction of symptoms.

Etiology.—The disease is a pus infection the result of the transmission to the skin through the medium of finger-nail-filth of a mixed infection of streptococci and staphylococci; often the one is grafted upon the other. The peculiarities of the former are the shortness of their chains, the slightness of their incurvations, their failure to interlace, and the irregular form of the elements of which the chains are composed. For these reasons an attempt has been made, without result thus far, to disassociate the germs of this disease from those found in the pus of other affections.

In some cases the irritation is set up by the encroachments of the trichophyton. In other cases there are pediculi of the occipital region, and the scratching set up in consequence of attacks of lice furnishes the opportunity for infection with staphylococci.

In children the disease is often associated with pyogenic nasal infection. It may be conveyed from one child to another and hence is frequently contracted in schools. Women contract the disease from children, while in men the most frequent source of the infection is the barber shop. Sometimes it develops upon areas previously in a morbid condition.

The eruption often occurs during convalescence from a more or less actively contagious disease. The antecedence of some fever in many cases is admitted by all observers. Duhring and Fox have seen it follow vaccinia, and the former admits that some connection between the two seems probable. It may occur typically in a series of children, each of whom is convalescent from varicella.

Pathology.—The lesions have been examined microscopically by Bockhart and others, who have thus been able to establish clearly the coccogenous origin of the disorder. Plainly, each lesion is but a distinctly circumscribed and superficial pea- to bean-sized abscess, situated between the intact corneous and the prickle-layers of the skin. Balzer and Griffon¹ agree with Thibierge and Bezangon in asserting that almost without exception the lesions of impetigo and ecthyma early contain streptococci and no staphylococci. In some cases, however, the staphylococcus pyogenes aureus and albus are present.² Darier and other French dermatologists describe an *impetigo streptococcigenata circinata*, in which the lesions closely resemble those of herpes iris, and in which the streptococcus only is found. Leroux and others, recognizing the fact that many microorganisms similar in external appearance, have decidedly different potentialities, have suggested that the streptococci responsible for the several clinical pictures of impetigo may differ in effect. Sabouraud³ has demonstrated that the streptococcus usually present is disguised by the rapidity of development of the staphylococci commonly recognized.

¹ La Presse méd., 1897, lix., p. 130.

² Cf. Engman, J. C. D., 1901, xix., p. 180.

³ Annales, 1900, s. iv., i., pp. 62 and 320 (report of his researches and review of literature).

In Unna's differential diagnosis of the impetigo- and eczema-pustule stress is laid upon the sero-purulent character of the contents of the latter, the dissemination of cocci throughout the lesion, the softening of the corneous layer in places, and the occurrence of morococci free and within the leucocytes. In impetigo the staphylococci are clustered, are extracellular, are relatively small, and are collected beneath the intact roof-wall of the lesion.

Dewèvre¹ reports a number of successful inoculations and auto-inoculations practised with the contents of the vesico-pustule, with finely powdered impetiginous crusts, and with the products of scraping the subjacent erosion. In 1884 I succeeded in producing an almost typical vesico-pustule upon the left forearm by inoculation (all due precautions being observed) with the moistened débris of crusts. This inoculation was done in the clinic, the crusts being taken from typical lesions upon the face of a young girl inoculated while under observation from the lesions of exactly similar character on the face of her twin sister. The lesions on the forearm produced a characteristic crust which in seven days was also used for inoculation of two students then present at the clinic, in one of whom there was no result, and in the other an abortive lesion.

The disease is contagious, and its lesions inoculable and auto-inoculable.

Diagnosis.—To establish the identity of this affection it is necessary to define its exact differences from eczema pustulosum. These differences are: first, the absence of infiltration of the tissues affected; second, the absence of itching; third, the failure of the lesions to form patches; fourth, the isolation and wide separation from one another of lesions distinctly pustular; fifth, the large development and rather persistent character of the pustules; sixth, the evident termination of the disease, which does not, as in many cases of eczema, progress to form a freely discharging and crusting surface, the pustular being but the initial stage of a distinct morbid process. Manifestly, however, an impetigo of the sort described is not incompatible with an eczema which is often originated by less irritating causes.

In ecthyma the pustules are in appearance much more formidable than those of impetigo in consequence of their size, depth, inflammatory base, areola, flat, hard and bulky crust, and erosive action upon the skin.

In varicella the lesions are small, much more widely distributed over the body, and are vesicular only, rarely bullous. In pemphigus and herpes iris the seat, character, and period of evolution of the lesions suffice to establish the diagnosis.

Treatment.—Individual pustules are to be opened with an aseptic needle; the purulent contents gently removed by washing with borated water; and the floor smeared with any mild ointment, such as 5 grains to $\frac{1}{2}$ scruple (0.33–0.66) of ammoniated mercury to the ounce (30.) of cold-cream salve, or bismuth subnitrate $\frac{1}{2}$ drachm

¹ Arch. de Méd. et de Pharm. mil., 1885, vi., p. 210.

(2.) to the ounce (30.), of benzoated zinc-salve. Van Harlingen recommends the application of a salve on bits of muslin, covering the whole with waxed paper. A dusting-powder containing calomel may be substituted for the salve or be employed afterward. The disease tends to spontaneous recovery if the lesions be not irritated. When they are situated within reach of a child's tongue which is constantly thrust out to moisten them, they may linger obstinately and require protection by flexile collodion.

ECTHYMA.

(Gr., *ἐκθύμα*, a pustule; *ἐκθίω*, I burn out.)

(Ger., *EKTHYMA*, *EITERBLASE*.)

The term "ecthyma," like several of the titles of chapters immediately preceding, no longer points to a distinct disease. In infants it affects the buttocks, in adult life the lower extremities. It occurs mostly in those suffering from circulatory and œdematous disturbances of the lower extremities and cachexia produced by alcohol, tuberculosis, and other debilitating diseases. It represents a tolerably definite group of symptoms readily separable clinically from other affections produced by different causes. The most common cause is infection of the skin of the lower extremities with pus-cocci after scratching; then follow traumatism, primary and secondary, associated with pediculi of the body (*pediculus vestimenti*), and combinations of these with bedbug-bites; general filthiness of the person and clothing of body and bed. The term ecthyma is, however, not to be discarded merely because of these composite etiological factors, as the picture produced in the skin is characteristic.

The eruption begins as a pustule, at the base of which cellulitis develops; destruction of tissue follows, producing an ulcer, pea to small-coin size. This is the chief clinical feature of the disease and the only lesion which the ancients called ecthyma. The ulcer of ecthyma is crater-like, and is surrounded by a bluish collar which elevates the tissue and causes the ulcer, though quite shallow, to appear deep. In many cases the ulcer is covered by a dark-colored, thick, rough, adherent crust.

The deeper lesions are followed by pigmentation and persistent punctate or larger cicatrices. The entire course of the disease occupies about two weeks. The subjective phenomena are a sense of heat, burning, pain, and soreness. There may be accompanying lymphangitis or adenopathy.

Etiology.—The pyogenic cocci (in particular streptococci) are the efficient causes of most of the lesions; practically the agents capable of producing eczema and dermatitis (traumatism, heat, scratching, parasites, etc.) either effectively operate or influence to a morbid degree the subjects of other diseases, such as anæmia, asthenia, struma, variola-convalescence, and menstrual disorders.

Filth and neglect are most common aggravations; in other words, that circumscribed cutaneous ulcer will be the angrier and the deeper which occurs in the victim of any depressing disease whose skin is scratched with nails begrimed with dirt, and is covered with the products of the excretory processes. The pus thus produced is in various degrees inoculable and auto-inoculable, as is the product of many inflammatory processes of similar grade.

Pathology.—In many cases of ecthyma there has been demonstrated a streptococcic infection of the skin, usually with but few chains of micro-organisms visible on bacteriological examination. The pustule of the disease differs from the pustule of eczema or the pustule of impetigo in the severity of the exudative process by which it is produced, and in its limitation to the exact seat of external irritation. By the extension of that process to the corium there is an actual loss of some of the elements constituting the papillary layer, the result often being a cicatrix which contracts as it grows older, and which is, in milder cases, finally barely visible as a minute cicatriform punctum. One who frequently examines the skin of the entire body with care can usually detect the ancient sites of these lesions by their indelible though insignificant relics.

According to Unna, the ecthyma-pustule, as distinguished from that of impetigo, is less an epidermal abscess than a result of epidermal inflammation, fibrinous at the centre and exceedingly cedematous at the periphery. The crust contains fibrin and epidermal layers.

Sabouraud points out that the original streptococcic infection is often succeeded by a secondary microbial involvement whereby the staphylococci present are enabled to produce the peripheral lesions of impetigo, furunculosis, etc.

Diagnosis.—Ecthyma is liable to be confounded with the other pustule-producing exudative affections, but as the distinction between them is largely artificial and based upon the severity of the inflammatory process, there is small danger in consequence. Kaposi expresses the truth in his suggestion that there can be but little objection to the employment of the term ecthyma when it is desired to characterize precisely the pustular grade of any cutaneous inflammation at a given time. The pustules of variola are "ecthymaform," and many of those seen in syphilis exhibit similar characters; but the history of the general affection should throw light upon the identity of the cutaneous disease. In syphilis, moreover, the ulceration at the base of the lesion exhibits the pronounced features of the syphilitic ulcer in its secretion, floor, edges, base, crust, and career. The crust, in particular, of the flat pustular syphiloderm has the rupioid conical appearance which suggests the shell of the oyster, and the underlying ulcer is larger and deeper than in ecthyma. In the furuncle there is usually a central core; in impetigo the pustules are not deep-seated, and there is no ulceration at the base; the crust is superficial, yellowish, firmly adherent, and the lesions are more numerous.

Treatment.—The general treatment of patients affected with ecthyma is a matter of importance. A proper regulation of the food and hygienic surroundings is not to be neglected. Tonics are frequently indispensable, including iron, quinine, and strychnine. The destruction of any pediculi and the cleansing of the skin with soap and water will often be sufficient to effect a great change. This fact is well illustrated in hospital practice, where young patients rapidly improve after a bath, followed by inunction with vaselin, and a few substantial meals of a nutritious character. When the lesions are abundant the treatment is in general that of pustular eczema. Crusts are to be removed after soakings with oil or fat; and the floors of the former pustules, after washing with carbolated water, should be dressed with an ointment containing from 10 to 15 grains (0.66–1.) of mercuric ammonio-chloride to the ounce (30.) of lard. If the minute basal ulcers are sluggish, they may, after careful cleansing, be touched with a small swab that has been dipped in a 0.5 per cent. formalin solution or in a solution of mercuric chloride in tincture of benzoin, 1 grain (0.066) to the ounce (30.). Carbolic or boric acid or iodoform may be employed for the same purpose. For the salve mentioned above may be substituted one containing 10 grains (0.66) of calomel, or $\frac{1}{2}$ drachm (2.) of bismuth subnitrate to the ounce of salve-basis.

DERMATITIS VEGETANS.

Under the title of *Pyodermite végétante*, Hallopeau¹ describes five cases of a disease affecting chiefly the scalp, axillæ, genitals, groins, lips, and the mucous membrane of the mouth, in which there appear miliary pustules which soon are surrounded by a hyperæmic base. The pustules appear in successive groups, coalesce, and the area thus formed becomes covered with crusts beneath which form more or less elevated vegetating surfaces. These patches may increase by peripheral extension, but more commonly by the formation of new pustules at the border. On the mucous membranes rupture of the pustules is followed frequently by superficial ulcers. The disease yields readily to antiseptic treatment, leaving only a pigmentation which gradually disappears. Hallopeau considered the disorder a type of local infection spreading by auto-inoculation. Similar cases have been reported under the title of *Dermatitis vegetans* by Hartzell² and Jamieson.³ Wende⁴ has reported two similar cases occurring in children during the course of eczema, in both of which papulo-pustules were followed by crusts and vegetations, chiefly on the scalp and face. He collates 12 other cases from literature, 5 in infants and 7 in adults. In all there was the same type of pap-

¹ Archiv, 1898, xliii., p. 289; and xlv., p. 323.

² J. C. D., 1901, xix., p. 465 (with histology).

³ B. J. D., 1902, xiv., p. 407.

⁴ J. C. D., 1902, xx., p. 58.

ulo-pustules appearing in groups, the resolution of old lesions with the appearance of new, the production of vegetations, and the disappearance of the disease under antiseptic treatment. The disorder is probably the result of an infection and not directly related to the eczema which preceded the disease in 7 (5 children and 2 adults) of the cases. The disorder is distinguished easily from pemphigus vegetans, which it resembles clinically, by the readiness with which it yields to antiseptic treatment, and by its failure to affect the general health of the patient.

CONGLOMERATIVE PUSTULAR PERIFOLLICULITIS.

Leclair¹ gave this name to an eruption which he described as appearing on the backs of the hands and buttocks and occasionally on other parts of the body.

The disease begins by the appearance of a round or oval, somewhat elevated, reddened or purplish plaque, with definite outlines. The plaque may be no larger than a dime, or it may be of the size of a large coin or larger, and may be elevated a quarter of an inch above the general level of the skin. Its surface is smooth or mammillated and is perforated by numerous follicular openings from which pus or dried plugs resembling comedones may be expressed. The openings of some of the follicles may be covered by unruptured pustules. Later, the patch becomes more phlegmonous, fluctuation can be detected, the follicles are more patulous, and pus in large quantity can be expressed. The whole then has much the appearance of a kerion of the scalp or of a flat carbuncle.

There is usually but one such plaque, though there may be two or three, rarely more. Subjective sensations are slight, though there is usually some itching and burning. There is no systemic disturbance. The disease runs a rapid course, requiring about a week in which to develop, after which it remains stationary for a week or two, and then disappears under appropriate treatment in from ten to fifteen days. More or less deep pigmentation remains some time after the lesions heal, but there is no ulceration and in the few cases in which scars are left these are usually very superficial.

FOLLICULITIS AND PERIFOLLICULITIS.

Quinquand and Pallier² describe a follicular disease which is chronic, becomes papillomatous, and is very stubborn under treatment. Besnier and Doyon³ enumerate five varieties of the disease, including two pseudo-ulcerative, serpiginous, and virulent forms which resemble anatomical tubercle.

Etiology.—These disorders are probably due to contagion, and are

¹ *Annales*, 1884, s. ii., v., p. 437 (with plates).

² *Des périfolliculites suppurées agminées en placards.* Thèse de Paris, 1889.

³ *Kaposi: Besnier-Doyon*, vol. i., p. 795.

seen most frequently in those who work among horses and other animals.

Pathology.—The process is an inflammation of the follicles, perifollicular tissues, and sebaceous glands. Leloir found several forms of micrococci and zoöglæa in the pus, but he failed to reproduce the disease by inoculation-experiments. Quinquaud and Pallier believe the active agent to be staphylococcus pyogenes albus, which accidentally obtains entrance to the follicles and glands. Sabouraud found in several cases a large-spored trichophyton.

Treatment.—The treatment is purely local. In the usual milder forms daily evacuation of pus, hot boric-acid fomentations, or frequent hot bathing, with antiseptic dressings, constitute the only treatment necessary. In the stubborn forms stimulating treatment by means of strong solutions of silver nitrate or of carbolic acid, or by means of the actual cautery, may be indicated. Occasionally it will be necessary to remove the growth with a curette.

FURUNCULUS.

(Lat., *furunculus*, a petty knave.)

(FURUNCLE, BOILS. *Fr.*, FURONCLE, CLOU; *Ger.*, FURUNKEL, BLUTGESCHWÜR, EITERBEULE, EITERGESCHWÜR.)

A furuncle is a staphylococcus infection of a hair-follicle producing a painful cellulitis which terminates in the death of tissue and the expulsion of a necrotic plug. Furunculosis is the succession of furuncles.

Symptoms.—Furuncles commonly begin as tender and painful indurations in the skin or its subjacent tissues, the summit of each nodule soon becoming visible in the epidermis as a reddish punctum. A furuncle is the result of an active inflammatory process, limited to a definite area, and of greatest intensity at the centre of the involved mass. This centre is often represented by a hair-follicle, the pustule that forms subsequently being perforated by a hair.

More or less rapidly thereafter these symptoms are succeeded by increased redness, heat, and tumefaction, the latter producing a nut- or egg-sized tuberosity, well projected from the surface or fairly imbedded within or beneath the derma. A yellowish point in the centre of the erythematous swelling soon announces the occurrence of suppuration. When accidentally or artificially opened at this summit exit is given to thick yellowish pus with which blood may be commingled from the traumatism of neighboring capillaries. The small abscess may then, after discharging its purulent contents for a few days, gradually close by granulation, or may also expel from its cavity a tenacious, pus-covered, yellowish-green slough, known as the "core." This evacuation is usually followed by relief of the tense and throbbing pain which is the well-known subjective characteristic of the furuncle.

The length of time requisite for the completion of this process varies with the extent of tissue involved, from a few days to several weeks. Boils may occur in any part of the body, but are most common about the face, the auricular region, the neck, the armpits, the anogenital surfaces, the hips, the buttocks, the breast, and the extremities. They may occur as single or as multiple lesions, or they may succeed each other in crops, especially about the buttocks, trunk, and thighs, for a period of several months. The disease of the skin may produce a constitutional effect manifested in pyrexia, which is usually encountered only in individuals of irritable constitution when the furuncles are few and short-lived. There is also a decided chloro-anæmia due to the pain, fever, purulent drain, irritability of nervous centres, inappetence, and consequent perversion of nutrition.

The sequels of boils are maculations of a violaceous tint, often perceptible in the skin for weeks and even months after their disappearance; and pinhead- to penny-sized cicatrices which are permanent.

Etiology.—The microbe which is the immediate cause of boils is usually, if not always, the *Staphylococcus pyogenes aureus*,¹ though other pus-producing cocci also are found in the lesions. The remote cause is often exceedingly obscure. It is true that boils are encountered in typical subjects of diabetes, of the exanthemata, and of "hospitalism," in whom anæmia, asthenia, marasmus, malnutrition, and exhaustion resulting from excesses, from grave general disease, from low fevers, and from nervous strain, play a prominent part. But the reverse is also true.

Scratching, eczema, scabies, other cutaneous diseases, lice, and external irritants of various sorts are responsible for many boils, especially those that are few and not followed by similar lesions. When, however, such sequence occurs it should not be forgotten that the pus is auto-inoculable, and that furuncles, if sufficiently numerous and large, are capable of disturbing the general economy. A collar-button at the back of the neck; the edges of an unyielding corset in one unaccustomed to it; a hard bench; a saddle-tree; a velvet coat-collar sheltering the germs responsible for a previous attack; and many similar articles may be the exciting cause of furuncles.

Account should always be had, in cases of persistent furunculosis, of externally operating poisons. In this category must be included sewer-gas emanations, arsenical wall-papers, and the poisons handled in the trades, *e. g.*, by dyers, lead-manufacturers, etc.

Lastly, it is exceedingly common for patients thus affected to apply to practitioners for remedies intended to "purify the blood"; and, inasmuch as potassium iodide is often prescribed in response to this demand, the original trouble is thus enhanced to a manifold extent. Many cases of furunculosis are instances of boils resulting originally from external irritation, that have greatly multiplied and finally profoundly affected the system under the impulse of the so-called "blood-purifying" process.

¹ Cf. Gilchrist, Johns Hopkins Hosp. Reports, 1903, xiv.

Pathology.—According to Unna, most furuncles begin with an impetiginous lesion due to the inoculation of the pilo-sebaceous follicle with pus-cocci, the organism being, in the majority if not all instances, *Staphylococcus pyogenes aureus*. The cocci penetrate deeply into the follicle, into ramifications of the sebaceous gland, and into the surrounding tissue. An abscess surrounding the follicle thus is produced which undergoes a necrosis *en masse*, producing the characteristic central core or slough. It is probable that in some instances the cocci are carried along the lymph-vessels to form abscesses about the neighboring follicles and glands. The lanugo hair-follicles are affected much more frequently than those of the stronger hairs.

Diagnosis.—Boils are to be distinguished from carbuncles by the aggravated symptoms of the latter. Circumscribed furuncular abscesses of the groins and the axillæ are not to be confounded with suppurating, sympathetic, or virulent buboes of these regions, associated with genital or extragenital contagious venereal sores. Errors of this sort have been made. Furuncles of the anal and genital regions in point of diagnosis may be significant of surgical affections of the neighboring parts (perineal, periprosthetic, peri-urethral, and scrotal abscesses in men; suppuration of the vulvo-vaginal gland in women, etc.).

Treatment.—The debilitated constitution of many patients affected with boils indicates clearly the need of a tonic regimen, including the administration of iron, quinine, and strychnine, the mineral acids, and, contrary to the generally accepted opinion of the laity, a generous diet of milk, cream, eggs, and fresh meats. To these articles of diet wines and malt liquors may at times be added with advantage. Change of climate, of diet, of cooks, and of the habits of life is most serviceable in cases of prolonged furunculosis. The mineral waters at some health resorts prove especially valuable for the debility which often results from these disorders. The urine should always be examined for sugar, albumin, and an excess of urates. The internal remedies which possess reputation in this complaint are arsenic, sulphur and the sodic sulphites, the alkalies, tar, fresh yeast in tablespoonful doses, phosphorus, and the syrup of the hypophosphites of calcium, iron, sodium, and potassium.

Calcium sulphide, which was once more highly esteemed than any other of the internal remedies named, is given in doses of $\frac{1}{10}$ to $\frac{1}{8}$ grain (0.0066–0.0133) every three or four hours. It is doubtful whether the drug exerts any influence whatever upon furuncles. In lithæmia potassium acetate or citrate is given in large dilution, or the liquor potassæ; in gouty states colchicum, salol, and the alkalies, including the sodic salicylate. No one of these articles, however, may be described as an efficient and certain remedy for the complaint; many cases will progress without hindrance from any or all of them. Fresh brewer's yeast, recommended by Löwenberg, Crocker, Brocq,¹ Des-

¹ La Presse méd., 1899, lxi., p. 45 (with bibliography).

fosses,¹ and others, is sometimes of service. A tablespoonful or less may be given three times a day.

Attempts in the direction of aborting a furuncle by the topical application of the stronger alkalies (*aqua ammoniæ*) or acids, caustics, cautery, ice, iodine, or carbolic acid, or premature complete excision with the scalpel, occasionally succeed, but often they fail. Boils may be aborted at times by the injection beneath the lesions of from 3 to 6 drops of a 3 per cent. solution of carbolic acid.

The objects of local treatment are to reduce the inflammatory process, allow the free escape of pus, and to prevent infection of other follicles in the neighborhood. The surface of the boil and the skin in the neighborhood should be kept thoroughly clean by frequent use of hot water and green soap, and the application at least twice daily of some simple antiseptic solution, such as 50 per cent. alcohol, 1 per cent. carbolic acid lotion, or weak bichloride solution. Stelwagon² recommends for the purpose:

R	Resorcin.,	gr. xv-xxx; 1-2	
	Acidi borici,	3jss; 6	
	Alcoholis,	f3j; 30	
	Aquæ dest.,	f3v; 150	M.

Before rupture of the furuncle it may be protected by means of an ointment or paste containing ichthyol, 1 to 2 drachms (4.-8.) to the ounce (30.), or, by protecting the surrounding skin with such an ointment or paste, hot antiseptic applications may be applied to the lesion itself. A convenient and effective dressing at this stage is found in the official cataplasma kaolini, containing sterilized clay, glycerin, and a mild antiseptic. Such a dressing may be continued even after the opening of the furuncle if care be taken to permit free discharge of the pus.

The furuncle should be opened freely with a clean incision when pus has formed, but not before. Violent squeezing of the furuncle to separate its slough or evacuate the contents should never be practiced, though it is permissible in some instances to scrape out the contents with a curette. The cavity should be cleansed thoroughly at least twice a day with hydrogen peroxide or with solution of carbolic acid or mercuric chloride, and packed with iodoform, boric acid, aristol, or other powder. In place of these powders, carbolic acid in crystal or in strong solution may be employed.

Prognosis.—Eventually the worst cases are relieved when unaccompanied by systemic or visceral disorders, and when the circumstances of the sufferer permit him to pursue the most advantageous course (travel, diet, abstraction from business, etc.). The resulting cicatrices depend upon the severity of the process. Often they are small and in the course of years become scarcely distinguishable; in exceptional cases they are large, persistent, and disfiguring. Lympius³

¹ *Ibid.*, 1892, liv., p. 653.

² *Diseases of the Skin*, 3d ed., p. 382.

³ *Deut. med. Wehnschrft.*, 1899, xxv., p. 474.

calls attention to the serious and even fatal complications (purulent arthritis, meningitis, thrombosis of frontal veins, septic infarct in lung) which may complicate furunculosis of the face, owing to the vascularity of the region.

CARBUNCULUS.

(Lat., *carbo*, a live coal.)

(ANTHRAX SIMPLEX, CARBUNCLE. *Ger.*, KARBUNKEL, BRANDSCHWÄRE; *Fr.*, ANTHRAX.)

A carbuncle is an acute, flattish, circumscribed, cutaneous and subcutaneous abscess, usually larger than a furuncle, that is due to the presence of staphylococci, and is characterized by dense induration and sloughing, terminating in favorable cases by the production of a persistent cicatrix.

Symptoms.—Carbuncles are often preceded by malaise, chill, and pyrexia of severe grades. There is commonly a burning pain at the site of the lesion. In cases in which the carbuncle is formidable and seated upon or near the head alarming symptoms of prostration, stupor, somnolence, and even coma, may be noted. With and without these concomitants a dense, dull-red, indurated, and painful phlegmon soon appears, varying in size from that of a small hen's-egg to that of an orange and even much larger, involving not only the skin, but also the tissues beneath. Suppuration finally occurs, but the pus is not confined to a single space; it undermines the integument and often through several apertures leaks out indolently to the free surface. The fenestrated or cribriform appearance of the skin covering the carbuncle constitutes in this stage one of its most striking features. Through these apertures may be distinguished the whitish or yellowish pus-soaked sloughs or portions of a single slough, which can at times be extracted through the orifice. Often the entire mass separates in a single slough involving the skin and subcutaneous tissues, leaving a crateriform ulcer of formidable size, which in favorable cases proceeds to heal by granulation. The resulting cicatrix is at first of a deep violaceous tint and later becomes blanched. It is indelible.

There is commonly one lesion; at times several simultaneously or successively develop. The sites of election are the neck, upper chest, buttock, and lower extremities.

The fever which usually accompanies this process may be mild or be severe, or, more commonly in dangerous cases, be of a typhoid character. It results unquestionably from sepsis due to unliberated pus and necrotic tissue, and is naturally most grave in its consequences in patients weakened by previous asthenic disorders. Under these unfavorable circumstances the carbuncle may spread at the periphery, enclosing islands of necrotic tissue and ill-conditioned pus separated by bridges of empurpled, infiltrated, and yielding skin.

The characteristic lesions of this disease most often appear on the

back of the neck, the back of the trunk, and the lateral aspect of the hips and thighs, usually in a single development, though occasionally two or even three carbuncles of small or of medium size may coexist. The reason for their appearance in the localities named is clear. It is here that the skin is most thick and resistant, and, as a consequence, purulent foci when formed are covered in by the most voluminous layers of the connective tissue of the corium.

Etiology.—Anthrax simplex is produced by the obscure causes to which reference has already been made as probably effective in the production of boils. Carbuncles and boils may coexist; or the one lesion may follow the other; and there may occur intermediate forms assignable to either class. The disease is encountered more often in men than in women, and in later than in earlier life, simply because the tissues constituting its sites of preference offer in these individuals and at these ages a greater resistance to the exit of pus. The pus-cocci may sustain an etiological or purely an accidental relation to the lesion. Carbuncle is at times an epiphenomenon in cachexia, diabetes, albuminuria, syphilis, pemphigus, and exfoliative dermatitis.

Pathology.—The pathological anatomy of carbuncle has been well described by Warren,¹ whose observations conclusively show that the inflammatory process here is that seen in the simplest pustule. The special symptoms of carbuncle are due solely to the formation of the phlegmon beneath the dense and extremely thick masses of fibrous tissue found in the back “for the protection of that comparatively defenceless portion of the body.” The cell-elements, multiplying with the intensity of the inflammatory process in the subcutaneous adipose tissue, pass upward along the fat-columns, crowd between these and push along the horizontal clefts branching from either side, infiltrate the derma, pass along the edges of the hair-follicles, fill the papillæ until the latter “balloon” with pus, ooze to the surface through the cribriform aperture in the undermined epidermis, and macerate the bundles of fibrous tissue relatively intact that constitute the undetached mass of sloughing tissue.

The constitutional symptoms in carbuncle (pyæmic, septicæmic, or sympathetic) are due solely to pus-imprisonment. The pus-formation is due to the presence of the staphylococcus pyogenes aureus and its toxine. Back of all (in the diabetic, the cachectic, etc.) lies the favorable soil for multiplication of the microörganism.

Diagnosis.—It follows from what has preceded that carbuncle and furuncle differ solely in the depth of the starting-point of the phlegmon, and the density and resisting power of the overlying tissue. The carbuncle is, therefore, flatter, denser, less rapidly developed, larger, less tender, and more painful; opens by many rather than by one or two apertures; and is followed by larger sloughs, ulcers, and cicatrices, and occasionally by fatal results.

Treatment.—Crucial and other deep incisions in the local treatment of carbuncle are certainly inferior in results to the course advo-

¹ The Pathology of Carbuncle, or Anthrax. Cambridge, 1881, p. 15.

cated by Wood¹ and Taylor,² whose method is employed in cases with complete success, namely: a saturated solution of pure carbolic acid is injected with a hypodermatic syringe through the several apertures in every direction into the sloughing tissues. When the orifices are not sufficiently numerous the point of the needle is thrust through the thinned integument at the summit of the swelling at several points. The pain is severe but short-lived; the tissues are blanched, indurated, and destroyed; the slough in a few days is readily separated after division of its slender fibrous attachments; and the ulcer rapidly contracts with the sequel of a smaller scar. It is necessary to use pure acid in saturated solution to prevent absorption of the injected fluid and the resulting toxic effects.

Relief is afforded in many cases by hot borated lotions and fomentations with the requisite skill in the surgical dressing of the parts, by carbolated lotions, extraction of the slough wholly or in portions with the forceps, and the subsequent employment of boric acid, iodol, iodoform, or aristol, or the paste recommended in the treatment of furuncles. An excellent method of withdrawing the purulent and sloughing contents of the carbuncle is to apply over it at the proper period an exhausted receiver, such as a common cupping-glass.

Erasion of the entire abscess with a curette and subsequent antiseptic dressing is an accepted radical measure of relief for employment in proper cases.

The antiseptic treatment of a carbuncle, however, furnishes the best results as regards the comfort of the patient and limitation of the disease. By this treatment there is absolutely no surgical interference with the lesion beyond the incisions made for the evacuation of pus. Violent squeezing and manipulation of the carbuncle are interdicted; it is freely powdered with boric acid, iodol, or iodoform; and on it is laid soft felt cloth thickly spread with any emollient and antiseptic salve, such as the ordinary zinc-salve. Boric acid in powder or iodol, thickly dusted over the carbuncle and covered with antiseptic wool, will also be found a useful dressing.

Internally calx sulphurata may be administered in full doses; it has, however, a questionable effect in diminishing the pus-formation.

Other constitutional treatment may be demanded in carbunculosis, including the liberal employment of tonics, a generous diet, a strict observance of the rules of hygiene, and stimulants when indicated. Pyrexia, septicæmic, pyæmic, and adynamic states require the special management of such complications, including cold sponging of the body-surface in fever, and the use of quinine, the mineral acids, and stimulants, with artificially applied heat in the algid condition. The urine should always be examined for sugar and albumin.

Prognosis.—A serious issue need only be anticipated when the complications described above are grave in character or they occur in asthenic constitutions.

¹ Toledo Med. and Surg. Jour., December, 1880.

² Australian Med. Gaz., December 1, 1881.

PHLEGMONE DIFFUSA (CELLULITIS).(Gr., *φλεγμονή*, an inflamed tumor.)

This is a suppurative inflammation of the subcutaneous tissue caused by a streptococcic infection. Frequently the infection enters through a discernible wound of the skin, but it may occur without previous lesion.

Symptoms.—In severe cases the disease begins with a chill and elevation of temperature. Usually the first evidence of the disease is a stinging sensation at the point of infection, which develops so suddenly and so closely simulates the feeling produced by an insect bite that the patient insists that he has been stung. The physician should exercise due caution in accepting such statements.

The lesion which first appears is a red nodule situated deeply in the derma or subcutaneous tissue. Movement of the subjacent muscles causes pain. The redness soon spreads until it involves an area the size of the palm of the hand and the original nodule assumes a bluish color, so that there is present a bluish nodule surrounded by an area of redness. The outer red area never presents a distinct outline but blends gradually with the healthy skin. The reddened area is infiltrated, hard, pasty-like; and pits on pressure. The central nodule becomes capped with a vesicle, ruptures, and discharges pus and necrotic tissue much to the relief of the patient. Painful streaks of lymphangitis extend to the neighboring lymphatic glands. Where the skin becomes gangrenous (gangrenous phlegmon) the danger of sepsis is so great that immediate operation is the advisable procedure. Metastatic abscesses may develop.

Treatment.—The lesion should first be treated with hot moist dressings. Where the fever continues and the inflammation spreads surgical interference is needed. The operation is not to be undertaken lightly. It is often necessary to open deeply between muscles. In some cases amputation is necessary to save life.

ANTHRAX.(Gr., *ανθραξ*, a live coal.)

(MALIGNANT PUSTULE, SPLENIC FEVER CARBUNCLE. *Fr.*, PUSTULE MALIGNÉ, CHARBON; *Ger.*, MILZBRAND, MILZBRAND KARBUNKEL.)

Anthrax maligna is a carbuncular lesion resulting from infection of the skin or other organ of the body with a virus containing the anthrax-bacillus, furnished by an animal infected with splenic fever.

This form of the disease in man, fortunately rare of occurrence, results from external inoculation and excepting a few cases of accidental post-mortem inoculations and by the prick of a hypodermic needle (Sée) is derived from animal products such as wool and hair or from animals affected with the specific malady variously termed "anthrax," "charbon," "splenic fever," "splenic apoplexy," or

"Texas fever." After inoculation with the disease from an infected animal the human subject may (a) perish from systemic poisoning wholly septicæmic in character with few external symptoms; or (b) when life is sufficiently prolonged, may suffer from visceral symptoms, and develop subcutaneous tumors; or (c) may exhibit the symptoms of the disease now under consideration.

Symptoms.—In from twelve hours to three days after inoculation a painless, somewhat pruritic macule, resembling a flea-bite, first is manifested, usually upon the dorsum or other part of the hands or the face, to which the virus has had access. The macule is followed in from twelve to fifteen hours by an inflammatory and pruritic papule, which is transformed rapidly into a flaccid bleb filled with a bloody serum. Usually the patient ruptures the bleb, exposing the base to view. At this point, the third or fourth day of the disease, the cutaneous lesion is fully developed. It consists of a plaque, the center of which presents a yellowish or blackish colored eschar surrounded by a collar of redness, studded with a few pustules. On palpation the plaque is found to be of cartilaginous hardness, extending deeply into the subcutaneous tissue and gradually fading into the surrounding tissue. Associated with this lesion is an extensive œdema involving an entire arm, the trunk, or face according to the location of the plaque. An œdema out of all proportion to the lesion with which it is associated is always suggestive of anthrax.

To complete the diagnosis a drop of pus from a pustule or in its absence, fluid from the red area is drawn into the needle of a hypodermic syringe to be examined microscopically, the operator observing due precaution in the operation. The bacilli stain readily with fuchsin.

The adjacent lymphatic glands enlarge and often suppurate; metastatic abscesses form; and the constitutional symptoms supervening are those described in connection with Equinia. If recovery is to ensue, the gangrenous mass will slough as in favorable cases of carbuncle; if the result is to be fatal, the process rapidly is aggravated by œdematous infiltration extending to a wider area and by greater tissue-necrosis.

In some cases the accompanying fever is high, with marked delirium; in other cases it is of a typhoid character. Death results from shock, septicæmia, or exhaustion, though in cases in which the lesion is circumscribed and unattended by constitutional symptoms recovery may ensue.

Etiology.—This disease is induced by infection from one of the lower animals, usually horned cattle, that suffer from charbon or splenic fever, and are handled by herders, ranchmen, etc. The susceptibility of the carnivora to the disease is very much less than that of the herbivora. It is claimed that not only direct inoculation may produce the disease, but that it may be transmitted through the medium of flies and other insects. More recently it is asserted that food, drink, and even inspired air may be the medium by which the disease is conveyed. The victims are chiefly male adults.

Pathology.—Since the first investigations reported in 1864 by Davaine to the French Academy, Pasteur, Klebs, Koch, Carnevin, and others have demonstrated that splenic fever is solely due to the multiplication in the blood and tissues of a rod-shaped bacillus, the *bacillus anthracis*, which is non-motile and transparent, measuring from 1 to 1.5 μ to 5 to 20 μ . Under culture the bacilli may develop long filaments many times larger than the original rods, with a distinct sheath about a protoplasmic cylinder, which filaments after segmentation furnish oval shining spores. These spores have been cultivated in generations, with resulting germs that produced the disease artificially in the lower animals.

FIG. 65.



Malignant pustule bacilli and pus-corpuscles.
(About $\times 300$.)

The pathological anatomy of malignant pustule is that of carbuncle, with the added fact that specific bacilli and spores are everywhere present in the blood and debris of tissue. There is an almost characteristic œdema of the papillary body, according to Unna; the margin of the epithelium is well preserved; there is an acute vesicular elevation of the horny stratum without a previous breaking up of the connective-tissue layer, and this induces a stretching of all the cavities in a vertical direction.

Diagnosis.—The characteristic features of typical malignant pustule are its central eschar, its crown of vesicles, and its indurated base. In establishing a diagnosis care must be taken to avoid one source of error. Malignant pustule in man is not of frequent occurrence in America, but occasionally various cutaneous eruptions are produced upon the hands after contact with animals or their hides upon which chemical solutions have been applied for the destruction of lice. These solutions usually contain arsenic, corrosive sublimate, or other substance capable of exciting a localized dermatitis. Chancre of the face, carbuncle, and poisoned wounds are all differentiated by their relatively indolent course and the absence of gangrene.

Treatment.—The treatment is to be conducted on the principles of general therapeutics. Deep incisions of the lesion, extended to the subcutaneous connective tissue, are often successful when practised before the occurrence of general symptoms.

Successful results have also been obtained from incision and iodoform dressings. Hebra was not in favor of early cauterization of the malignant pustule, and it may be considered a questionable method of procedure. A grave case of malignant anthrax is recorded in which recovery ensued after hypodermatic injection of tincture of iodine. Three syringefuls of pure tincture were deposited beneath the skin at the periphery of the diseased surface, and lint saturated with the same fluid was applied over the slough. Internally, 15 drops of iodine tincture (1.), with 3 grains (0.20) of potassium iodide, were also administered. Normal cicatrization followed in this and six other cases recorded,

Crucial incisions with the free application afterward of pure carbolic acid have been followed by good results. Internally, sodium hyposulphite and quinine are successfully employed. The febrile, typhoid, and adynamic features of the disease are to be treated in accordance with the recognized principles of general medicine.

Prognosis.—The disease proves fatal in about one-third of all cases. Early excision gives promise of satisfactory results.

EQUINIA.

(Lat., *equus*, a horse.)

(GLANDERS, FARCY, MALLEUS. *Fr.*, MORVE, FARCIN. *Ger.*, ROTZKRANKHEIT, MALIASMUS.)

Equinia is a contagious, virulent, and inoculable disease, transmitted to man from the horse, mule, ass, or other animal; and produced by a bacillus resembling that of tuberculosis. It is conveyed either directly or mediately by the application of cloths and other articles which have been in contact with the bodies of infected animals.

Symptoms.—The acute form of this disease commonly follows a period of malaise lasting a few hours or a few weeks, during which period the patient complains of vague pains of a rheumatoid type, followed by thermal variations. The body-temperature rises rapidly to the point of danger, with chills, fever, diarrhœa (often following constipation), and rapid exhaustion, the picture being suggestive of acute septicæmia.

The cutaneous symptoms begin often with an erysipelatoid blush, the infected and swollen surface also producing papules, vesicles, pustules, and bullæ, with dense but ill-defined induration of the subcutaneous tissue; or reddish and yellowish papules appear, which, as in the case of the fluid-containing lesions, coalesce and furnish a bloody discharge. These symptoms, in the case of inoculated disease, may develop on the site of the healed or healing wound of entry of the virus, and later become generalized. Sloughing ensues more or less rapidly, sometimes with extensive gangrene, though the patient often succumbs before the culmination of the morbid process. The lymphatic vessels are swollen and well defined, often indurated nodules (farcy-buds) forming in the lymph-glands and -channels. These symptoms chiefly affect the face, hands, feet, and other exposed parts of the body. There is often a sanious or purulent and offensive discharge from the nostrils, the mouth, and the eyes, the inflammatory process spreading rapidly to the deeper mucous surfaces. This catarrh, chiefly nasal in site and declared conspicuously by the nasal voice due to the blocking up of the nostrils by the viscid, foul-smelling, hemorrhagic discharge, is one of the most characteristic features of the malady, and is of importance in the diagnosis.

In the chronic form of the disease the nasal catarrh is less conspic-

uous at the outset, though later it may be a prominent feature of the malady. A few days or weeks after infection, pustules, as in the acute form, resembling those of variola, but flattened and never umbilicated, begin as vesicles or even as papules, coalesce to bullæ, occur in successive crops, and proceed to the production of multiple abscesses, poorly defined on the extremities and about the face, much more rarely developed on the trunk. These abscesses may be of phlegmonous type; or be deep, brawny infiltrations with purulent foci, extending over months of invasion and decline of the disease. From these abscesses, pea- to nut-sized over the face, larger on the limbs, flows an abundant, sanious, semiliquid or viscid, yellowish, offensive pus. Ulcers form at many points, with purplish borders, oval or roundish contour, and thin edges, suggesting the scrofulous ulcer of classical type. The edges may be soft or indurated. By this multiplication or coalescence the lips, nose, eyelids, and other parts of the face may be destroyed in part or wholly. The disease may steadily advance or may seem to be arrested for a time and reawaken to activity. Meantime the lymphatic glands are either unchanged or are enlarged by sympathy. In the course of months or years there is a fatal issue. The disease is, fortunately, rare.

Meyer and Crohn¹ fully reported a case of acute glanders from New York City in 1907, and Bevan and Hamburger² reported three cases occurring in Milwaukee in the same year. A fatal case occurred in the Presbyterian Hospital of Chicago in 1908 in a physician infected from laboratory cultures with which research work was being performed.

Etiology and Pathology.—Equinia is almost invariably produced by infection from horses, a history of contact with such animals being one of the important points in establishing a diagnosis, though rarely it is transmitted also from man to man. The infection is produced by the *glanders-bacillus* (Weichselbaum, Schütz Löffler, Boucharde). This organism is nearly of the size of the tubercle-bacillus, having been cultivated and found capable of producing the disease in the lower animals after injection of cultures. The bacilli are abundant in papules, abscesses, blood, and brain-tissue.³

Diagnosis.—In all cases the clinical diagnosis should be substantiated by the Strauss⁴ method. An agar-agar culture of the glander bacillus or secretion from lesions is injected into the peritoneum of a male guinea pig. Within seven days an orchitis develops from which the bacillus may be recovered.

¹ Acute Glanders. Report of a case with review of recent literature and a complete bacteriologic report. J. A. M. A., 1907, l., pp. 1593-1595. (A complete report including reference to nine additional cases reported to the New York Board of Health during the two preceding years.)

² The Occurrence of Glanders in Man, Ibid., 1907, l., pp. 1595-1599. (A full report clinical and bacteriologic of three cases.—Bibliography.)

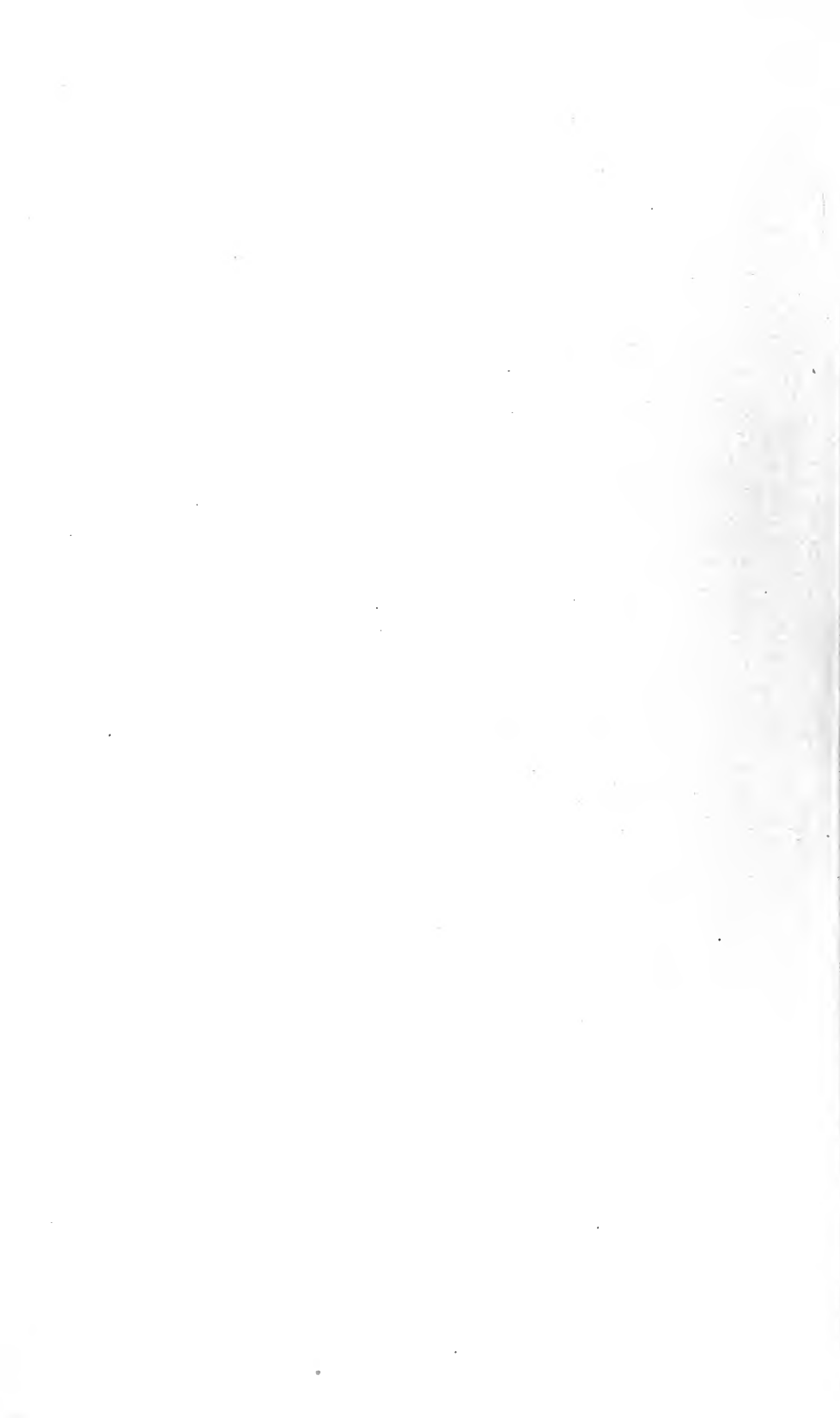
³ Cf. Coleman and Ewing, Jour. Med. Resch., 1903, ix., p. 223 (report of case with autopsy, histological and bacteriological findings, and bibliography).

⁴ Archives de Méd. expér., 1888.

PLATE IX



Cutaneous Lesions in Equinia. (Howard Morrow.)



Treatment is that of the septic condition, and is of little avail.
Prognosis is in the highest degree grave.

DISSECTION-WOUNDS AND ANIMAL POISONS.

Aside from verruca necrogenica, or anatomical tubercle, described in the chapter on Tuberculosis Cutis, lesions generally known as "dissection-wounds" occur with symptoms of acute poisoning upon the hands of those exposed in post-mortem examinations and dissections. At the inoculation-point, which may be either the site of a former abrasion, a rent, or the mouth of an open follicle, a painful vesico-pustule, papule, tubercle, wart, furuncle, or hemorrhagic bulla rapidly rises from an angry and indurated base with hyperæmic areola of dull-red shade. Suppuration, crusting, or ulceration, limited to the seat of the lesion, may follow; or there may occur lymphangitis in various grades with consequent pyæmic or septicæmic involvement of the system. Suppurative and non-suppurative axillary buboes are common. Gangrene and necrosis of the soft parts and the bones, especially the phalanges, may ensue, as may also a fatal result from the systemic disorders named. Rarely an acute and fatal septicæmia may result when the lesion at the point of inoculation is so slight as to pass unnoticed. In a few cases chronic marasmus is induced.

Post-mortem pustules originate from infection with cadaveric poisons in the dissecting-room or dead-house. A pruritic macule either at the site of an abrasion or elsewhere soon develops, and is transformed into a vesico-pustule with a reddish halo, which bursts, and is covered with a crust beneath which pus repeatedly forms. Occasionally there is coincident adenopathy.

The nature of the infection varies in different cases. It is most commonly due to pyogenic bacteria, but may be caused by the specific microorganisms of tetanus, erysipelas, anthrax, or other infectious disease. The absorption of toxines resulting from the decomposition of animal tissues is undoubtedly an important factor in the infection.

Treatment.—The wound should be cleansed and opened and a moist dressing of alcohol three parts and water one part applied both to the wound and the accompanying lymphangitis.

PUSTULES AND OTHER LESIONS RESULTING FROM WOUNDS INFLICTED BY REPTILES AND INSECTS are often of an insignificant character. Such are the trivial results of the bites or the stings of flies, fleas, mosquitoes, ants, bees, hornets, etc. At other times, however, serious and even fatal consequences have been recorded. The wounds produced by the tarantula and the scorpion (which frequently lurk in the clusters of tropical fruit now imported to almost every part of the United States), as also of venous reptiles, may prove to be grave. Urticarial, vesicular, pustular, papular, bullous, and petechial lesions may thus originate and be the cause of a more or less severe dermatitis. See also Chapter on Myiasis.

ERYSIPELOID.

(ERYSIPELAS CHRONICUM, PROGRESSIVE PHLEGMON, CRAB CELLULITIS, ERYTHEMA SERPENS, ERYTHEMA MIGRANS.)

This term is employed by Rosenbach¹ to designate a special inflammation of the integument occurring as a complication chiefly of traumatism. When a wound is infected with the special poison of the disease a peripherally spreading, tumid, and empurpled halo encircles the site of infection, which slowly disappears in the part originally attacked while it extends progressively to another area. The advancing border of the disease is distinctly circumscribed, and may be festooned or scalloped. New points may appear from which the violaceous redness spreads, while others are in a state of apparent inactivity. This affection may be complicated with furunculosis, but scaling is said never to occur. Itching and burning sensations are usually present.

Rosenbach believes that the source of this disease is a microorganism of the order Cladothrix, existing in putrid flesh and cheese, from pure cultures of which organism he is reported to have induced the disease. Gilchrist² found no microorganisms in his cases and he did not succeed in producing the disease in healthy susceptible individuals by inoculation of blood taken from the lesions of those suffering from the disease. He believes that it is not microbic but a toxic erythema.

The disease affects chiefly the fingers and hand (according to Elliott, also the scratched toes) of scullions, meat-dressers, fish-dealers, poultry-cleaners, and persons of similar occupations. The distinction between this disorder and erysipelas is based chiefly on the indolence of the former, its more superficial involvement of the skin, and the absence of constitutional symptoms. It is to be carefully distinguished from Crocker's "dermatitis repens" (some instances of which may be here included), from erythema multiforme, from erythema iris, and from ringworm of the hands.

Treatment.—Treatment is efficient with local application of formalin, ichthyol, resorcin, pyoktanin-blue, pyrogallol, potassium permanganate, or the mercurials in salves or in lotions.

ERYSIPELAS.

(Gr., ἐρυθρός, red; πέλλα, the skin.)

(ST. ANTHONY'S FIRE. Ger., ROTHLAUF, ERYSIPEL. Fr., ERYSIPELE, LA ROSE.)

This is a migrating streptococcus infection of the deeper structures of the skin spreading through the lymph spaces without following the lymph current.

¹ Verhandl. der deutsch. Gesell. für Chir., 1887, xvi., p. 75.

² J. C. D., 1904, p. 507 (complete literature).

It is one of the most dreaded of infectious diseases. The occurrence of a case in hospital practice necessitates the discontinuance of all surgical operations, the removal of the patient to an isolation-pavilion, and thorough disinfection of the bedding and the room occupied by the patient.

In private practice physicians doing surgical and obstetrical work should not treat erysipelas, nor should the attending physician touch the morbid area without subsequent thorough disinfection of the hands.

Symptoms.—This disease is usually preceded by a prodromic period of malaise (lasting for twenty-four hours or less), which may be ushered in by one or several chills followed by febrile symptoms. The latter are accompanied by anorexia and often by vomiting with general depression and headache.

The eruptive symptoms are generally first displayed at a given point, from which the disease progresses. It is commonly first noticed in a nut- or egg-sized patch, the integument of which is tumid, slightly elevated, irregular in contour, distinctly circumscribed, without peripheral islands (these are of importance in the diagnosis of erysipeloid), and which presents a rosy or crimson-reddish color with a peculiarly smooth and characteristic shining or glazed appearance. The sensations awakened may be those of moderate pruritus, of pain, heat, or burning. To the touch the affected part is tender, moderately firm, and perceptibly hotter than normal. The color fades under pressure to a yellowish white.

In typical cases the erysipelatous blush and swelling spread over an area which may be of the size of the palm, or may even cover the surface of an entire limb or large area of the body. In cases of moderate grade the inflammation attains a maximum of extent and severity within a week, remains apparently unaltered for a day or more, and then begins to abate, with amelioration of all the concomitant symptoms. The fever, which often precedes the eruption, continues unabated during its progress, the temperature rising to 105° or 106° F., with nocturnal exacerbation, cephalic and lumbar pain, dryness of the tongue, gastric distress, and occasional delirium. As involution of the disorder is accomplished the redness is replaced by the brownish, bluish-red, and dirty-white shades often seen after the disappearance of erythema multiforme, the epidermis finally desquamating in various degrees according to the extent of the preceding inflammation.

In other cases, in which the exudation of serum beneath the epidermis has been rapid, the epidermis is raised in the form of vesicles, pustules, or bullæ, more often the latter, and precisely as in the severe forms of dermatitis calorica, with which erysipelas presents a certain analogy, gangrene of the skin may result in the part affected. This complication is particularly liable to follow the disorder when it attacks the seat of surgical wounds and injuries.

Surgical accidents aside, the face is the commonest seat of the dis-

ease, on which the blush may be first seen upon one side of the nose, a cheek, a lip, or an eyelid. It often attacks the lobe of the ear after the operation of piercing the lobule for the insertion of ear-rings in women; thence it may extend over the whole face, inclusive of the mucous linings of the mouth and the nose, that present a dry, tumid, and glazed appearance, suggestive of the symptoms displayed upon the skin. The inflammation may extend to the hairy parts, but in many cases it exhibits a species of reluctance to transgress the limits there presented. It may be noticed in cases of mild grade, in which no applications have been made to arrest a local progress, that the elevated border spreads symmetrically to within a few lines of the male beard or the hairs at the edge of the forehead, and there is arrested. In severer grades these limits are surpassed, and then, as a rule, the extension is rapid and formidable. In this way the entire head may become enormously swollen, suggesting to a casual observer that it is twice its normal size. The patient then is greatly disfigured; his scarlet lips are swollen and parted, permitting the escape of saliva; the ears, as usual when greatly enlarged, project in a marked degree from the side of the head; the eyelids are œdematous and incapable of separation; the face is disfigured by bullæ or crusts; and the mind disordered in the violence of the fever or the accesses of delirium. When recovery ensues the hairs generally fall.

All regions of the body may be invaded, such as the vaccinated arm, the leg the skin of which is involved in venous varicosities, the scrotum or the umbilicus of the infant, the genitalia of the newly delivered woman, the breast of the nursing-mother, and every surface which has been the seat of punctured, incised, contused, or poisoned wounds, or other accidents of the integument to which the germs of the disease may have had access.

The febrile symptoms are, throughout, persistent and characteristic of a specific toxæmia. The body-temperature, as has been seen, may reach 105° to 107° F., with vespertine exacerbations and remissions; it may also become subnormal. If not relieved in the course of seven or eight days, complications may be expected, namely, œdema, abscess, phlegmonous inflammation, gangrene, or inflammatory accidents involving the membranes of the brain, lungs, heart, bowels, kidneys, peritoneum, or joints, together with coma and delirium. Death may result from the complications or from shock, exhaustion, or pyæmia.

Erysipelas Ambulans.—This is a term used to describe that form of the affection in which the erysipelatous blush, after involving a given area, spreads with greater or less rapidity to the parts in the vicinage, either by direct extension and uniform advancement in one direction of the tumid and distinctly circumscribed border, or by linear, digitate, or irregular prolongations radiating from the inflammatory focus. As the blush and swelling advance in one direction there is usually a correspondingly rapid disappearance on the other. At other times the disease, while extending to a new area and abandoning the old, is

relighted in the latter, and thus an irregularly involved and irregularly extending erysipelatos surface presents for weeks the varying phenomena of the disease. In yet other cases, chiefly those in which there has been a history of traumatism, a long erysipelatos linear streak or band may spread from the site of the traumatism in one direction or another, suggesting the indurated lines observed in lymphangitis.

Chronic Erysipelas.—Habitually recurrent and indolent erysipelatos attacks, the identity of which with the disease here described it is difficult to establish, occur frequently. Some of these cases are due probably to repeated infection with bacteria which may be attenuated or less virulent forms of the cocci found in the severe types of erysipelas. Many cases, however, reported as “chronic or recurring erysipelas” are instances of eczema, dermatitis, or rosacea which are subject to acute exacerbations. Instances occur in which the face, wholly or in part, is the seat of a low grade of inflammation with local heat, swelling, redness, considerable infiltration, and some tenderness, the skin being irritable and worse after exposure to a high wind or after excesses at the table. But most of such cases fail to exhibit the distinct imprint of erysipelas; they are not only chronic in course, but are also exceedingly indolent, often lasting for years; they are unaccompanied by fever; they distinctly are limited in all accesses of aggravation to the same part of the face; they are characterized rarely by a bullous efflorescence; many occur in the subjects of chronic alcoholism; and the specific germs of erysipelas are not present.

Etiology.—Erysipelas is caused by the streptococci of Fehleisen, or other organisms, which gain admission to the tissues through some lesion of the surface. The site of infection may be a surgical or other wound, or it may be a slight scratch or an unrecognized abrasion of the skin or mucous membrane.

In the face, catarrhal and ulcerative processes involving the mucous membrane of the mouth, ears, and nose are often the cause of erysipelas, these processes occurring in a wide range of disorders from syphilis of the nasal bones to caries of the teeth. Tuberculous and other ulcers, as well as eczema and several skin-diseases, frequently furnish a means of ingress to the streptococci. Injuries of, and surgical operations upon, the scalp not conducted with antiseptic precautions, and the common piercing of the lobe of the ear in women and female children for the insertion of ear-rings, may be followed by the appearance of the disease upon the scalp, as a result of which the hair often falls. Fistules, vaccination, lesions of the tender umbilicus of the newborn infant, and railway accidents may be named as common causes of the disease in other regions.

Predisposing causes of this disease are to be sought for in cachexia, general debility, alcoholism, kidney-disease, epidemic influences, traumatism, violation of hygienic rules, idiosyncrasy, and occasionally the recurrence of previous attacks.

Jordan¹ and others have demonstrated apparently that the disease,

¹ Münch. med. Wehnschrift., 1901, p. 1371.

in both mild and severe forms, may be produced by staphylococci as well as by streptococci. Jordon has shown that typical erysipelas may be produced in the rabbit by a number of different cocci.

Pathological Anatomy.—The disease is an acute inflammation of the skin and of the subcutaneous tissue. Unna, whose examinations were made largely in the skin of children and infants, found invariably a simultaneous invasion of both the cutis and the hypoderm in erysipelas, the former recovering far more rapidly than the latter, and rarely reaching such a grade of activity. The venous capillaries were all enormously distended, as if paralyzed by the poison present, and the collateral lymphatics with the lymph-spaces were equally dilated. All the cutaneous vessels swarmed with streptococci, both in the central and the marginal zones.

Diagnosis.—Erysipelas is to be distinguished from the erythema, from dermatitis of various grades, from eczema, and from scarlatina. As a rule, its recognition is readily effected when the presence of the fever in erysipelas is kept in view, as also the peculiar shining, swollen, and rosy-reddish to damask hue of the affected parts. The redness is never produced, as in scarlatina, by multiplicity of reddish puncta, nor is it so widely diffused as in that disease. Erysipelas may at times be accompanied by a pruritic sensation, but the patch which it affects is never by any possibility scratched. By this simple test alone one may often distinguish an erysipelas of the face from an eczema of the same region in a child. From a chronic dermatitis with thickening of the affected tissues and redness of the surface, erysipelas is to be distinguished by its tendency to spread, by its acute course, by its frequent association with bullous or vesicular lesions, and by the color, outline, and raised border of the affected patch. However, it must be understood that to these localized patches of chronic dermatitis several authors have given the name "chronic erysipelas," the difference between the views held on this point being chiefly one of titles.

Treatment.—The method of treating erysipelas by the administration of the tincture of iron internally has long been popular among American practitioners, but its efficiency is questionable. This preparation is given in full doses, from 10 to 50 drops, day and night every two to three hours, irrespective of the febrile state.

The constitutional treatment is important, but is solely symptomatic, and should be directed to lowering the temperature, to obtaining proper functional activity of all the organs of the body, and in prolonged cases to sustaining the strength of the patient. Locally, no matter what application is made to the surface, the affected area should be covered with gauze and bandaged. Equal parts of ichthyol, lanolin, and vaseline make a very satisfactory dressing for the average case. It may be applied once or twice daily. Fraser¹ uses pure carbolic acid. As soon as the skin becomes white it is mopped with absolute alcohol. The purpose of such treatment is to limit extension of

¹ Brit. Med. Jour., 1901.

the disease. It is true that these measures will not always succeed, but it is erroneous to assert with some authors that they always fail. Certain it is that, whether effective or not in the production of the result, the advancing border of the disease will often fail to surpass the limits thus artificially described. Heppel¹ recommends the painting over the surface of a 10 per cent. solution of carbolic acid in alcohol, as an abortive treatment, for which Braithwaite² substitutes a solution of tannin of the same strength.

Good results have been reached in the local treatment of erysipelas, first by attempting to limit the extension of the disease by the application of the tincture of iodine over the peripheral zone, and, secondly, by retaining over the entire surface affected neatly applied compresses saturated with a solution of sodium hyposulphite in the strength of about 1 drachm (4.) to the ounce (30.), or with 95 per cent. alcohol.

Attempts to limit extension of the disease by local applications of an irritating sort (corrosive sublimate, silver nitrate, carbolic acid, tar, turpentine, etc.) are sometimes positively injurious. Dry heat applied by the aid of cotton or wool, cold compresses, or iced lead-lotions with intermissions of application, salicylic acid, boric acid, iodol, resorcin in solution, or iodoform in powder may be used. A 95 per cent. alcoholic or a saturated solution of boric acid often gives good results if painted frequently over and for an inch or more beyond the affected area, or if applied on compresses.

Koch applies 1 part of creolin, 4 of iodoform, and 10 of lanolin, covered with gutta-percha. Hallopeau praises 1 part to 20 of sodium salicylate in aqueous lotions upon folds of linen. Tabit claims to abort the disease with 10 per cent. solution of iodol in collodion. Injections of anti-streptococcic serum have been used with varying success.

It is needless to add that all surgical indications are to be fully met when they are present: pus is to be evacuated, crusts removed, and drainage secured.

Finally, there are forms of erysipelas which are remediless; they are usually septic in character. The scarlet blush spreading from an irreparable injury of long duration is often the last protest of Nature against the damage which even her final resort of gangrene will not avail to repair.

Prognosis.—Under favorable circumstances erysipelas, even of severe grade and extensive invasion, terminates in complete resolution. Reserve should be made, however, in every case, as a serious complication has often transformed the simplest into the gravest form of the disease. The very young, the cachectic, the victims of drink, the aged, the inmates of hospital-wards depressed by other illness, and those mentally distressed by destitution and neglect, are particularly liable to suffer from grave and fatal forms of the malady.

¹ Arch. of Derm., April, 1881.

² Brit. Med. Jour., April, 1881.

The patients who fill the beds in most lying-in hospitals are young women, either unmarried or deserted by their husbands, and unprovided with the necessities of life by those upon whom such a responsibility rests. The mental depression thus originating in connection with septicæmic influences is responsible for much of the relation which erysipelas often seems to sustain to the puerperal state, as also for the appalling mortality which it may exhibit under these circumstances.

DERMATITIS REPENS.

Under this title Crocker first described an inflammatory disease of the skin (usually a consequence of injuries) spreading with a marginate border, and, as a rule, beginning over the upper extremities. Cases have since been reported by Garden and Nepveu, Hartzell,¹ and others.

The inflammation spreads from a traumatism, eventually producing a raw, reddish surface denuded of epidermis and oozing at several points, the serous exudate also undermining the apparently sound cuticle. The disease spreads with uninterrupted regularity, lasting for months, and in cases invading the larger part of an upper extremity. Extension occurs by the appearance at the periphery, of new vesicles or small blebs, or by the elevation of the adjacent epidermis with the fluid exudate. In either event, detachment of the epidermis leaves the characteristic, denuded, red surface. There is a definite margin to the affected patch. The disease may begin with the formation of blisters.

The disease has originated in cicatrices after amputation of a finger, from burns, from irritation of the feet after walking barefoot on sand, and from splinters under the nail. Crocker believes that the dermatitis results from peripheral nerve-irritation, and that there is a secondary parasitic involvement of the part. The disease seems to be an infectious dermatitis, the traumatism being simply an initial factor of the process. The parchment-like epithelium often left after healing shows that the process may be one of considerable destruction of epidermal and dermal tissues, which may result in diffuse but superficial atrophy and cicatrization. The diagnosis from eczema depends chiefly upon the recognition of the limited outline of the disease, the entire denudation of the surface, the undermined edge, and the thinned, shining epidermis left after healing. The affection is to be treated as a parasitic dermatitis.

Two cases of this disease were supposed to have originated in the minute traumatisms of the finger-nails occurring when farm-laborers are engaged in husking Indian corn by hand; and one well-marked case followed the amputation of a finger. An excellent illustration of the disease is given in a colored lithograph accompanying the report of a case by Stowers.²

¹ J. A. M. A., 1902, ii., p. 1581 (brief summary of reported cases).

² B. J. D., 1896, viii., p. 1.

In three cases treated by us success was obtained in one after employing locally a saturated solution of pyoktanin-blue. In another case that had resisted continued and varied treatment the lesions disappeared rapidly under application of a solution of sodium hypsulphite. Still another case yielded to applications of strong white-precipitate ointment. Crocker recommends a strong solution of potassium permanganate.

Acrodermatitis Perstans (*Acrodermites Continuées* Hallopeau).—Under this title Hallopeau, Audry,¹ Crocker, and others describe a condition very similar to that of dermatitis repens in that it begins on, and often is limited to, the extremities; originates frequently in traumatism; begins often as a vesicle spreading peripherally; and is rebellious to treatment. Hallopeau describes vesicular, bullous, and purulent types. The disease begins frequently on a finger, to which it may be limited for weeks before it commences to spread. On rupture of the vesicles or pustules a reddened excoriation is left similar to that seen in dermatitis repens. The condition differs from dermatitis repens in the frequent appearance of secondary eruptions, often pustular in form, on portions of the body even at a distance from the region first affected, and larger areas frequently are formed by the coalescence of a number of foci. The secondary eruption may be in the form of an exfoliative erythema, and may involve symmetrically considerable portions of the body. The disorder further differs from dermatitis repens in the tendency to recur frequently in the same place. It is also more persistent and occasionally terminates fatally. The disorder is allied closely both etiologically and pathologically to dermatitis repens.

The treatment is practically the same in both disorders. For acrodermatitis, Hallopeau recommends a solution of silver nitrate, 1 drachm (4.) to the ounce (30.).

DERMATITIS GANGRÆNOSA (SPHACELODERMA).

Gangrene of the skin may result from a dermatitis originally due to the action of either excessive cold or heat; to the action of externally applied chemical agents (caustics, strong acids, alkalies, etc.); to shock; to ergot and other substances ingested; to infectious diseases (lepra, tuberculosis, syphilis, erysipelas); to central nervous diseases (decubitus, Raynaud's disease); to disorders of the blood-vessels (embolism, thrombosis, acute and chronic endarteritis obliterans, calcareous changes in the arterial vascular tunics); to compression of vessels by ligature, by tumors, or by inflammatory products.

Multiple Gangrene of the Skin due to local infection of tissues having diminished power of resistance may complicate typhoid fever (Huhl)²; malaria (Osler³); erythema multiforme⁴; and other dis-

¹ Annales, 1901, s. iv., ii., p. 913 (with summary of reported cases).

² Amer. Jour. Med. Sci., 1900, p. 251

³ Johns Hopkins Hosp. Bull., 1900, p. 41.

⁴ Archiv, 1905, lxxviii., p. 247.

eases; it may occur without the cause of diminished resistance of the tissues being determined. Hartzell,¹ Wende² and others³ report cases in which the lesions were apparently auto-inoculable, and in which bacilli and cocci were demonstrated.

Nosocomial Gangrene.—It is now recognized that this form of gangrene, which under favorable conditions is contagious, is due to the Vincent bacillus. Through the work of Matzenauer, and Rona,⁴ it has been shown that this bacillus sometimes causes gangrene in ulcers of the skin.

The most common form of gangrene of the skin has been described by Hallopeau.⁵ The infection occurs on the face, especially on the forehead, as an acne-like papule, the epidermal covering of which quickly exfoliates, leaving an ulcer, which may remain superficial and disappear leaving a scar, or it may be covered with an eschar which may persist unchanged for a long time, or the process of ulceration may extend under the eschar, or groups of new papules may develop; the same disease may affect the mucous membrane of the mouth and the lymphatic glands may become involved. The disease should not be treated with moist dressing; dusting powders or ointment produce better results.

Diabetic Gangrene occurs most frequently upon the toes and feet, though on other portions of the extremities and even elsewhere, of patients affected with glycosuria. The first lesions are usually blebs which, after evolution, desiccate in the center and furnish black crusts, new lesions often springing into existence at the periphery, thus producing a serpiginously spreading area with vesicular border. Either dry or moist gangrene of the affected part may result. At times extensive sloughs form, one or several digits, or the whole foot, falling spontaneously, or requiring removal by the expedients of surgery. The danger, however, of surgical interference in these cases is obvious. Cases are on record where gangrene of the fingers and toes has occurred in diabetic patients without the previous occurrence of blebs. We have had under observation several cases in which there had been precedent syphilis where pancreatic gummata were believed to exist; and also have observed symptoms of equal gravity where there was no luetic history. The association of gangrene with diabetes is believed to be due in part to the fact that the tissues of patients suffering from the disease last named, in consequence of weakened resistance furnish a favorable medium for the growth of bacteria.

The treatment of these cases, though exceedingly unpromising, is at times rewarded with excellent results. Many cases prove fatal. Surgeons are rarely justified in amputation; but removal of dead tis-

¹ Amer. Jour. Med. Sci., July, 1898.

J. C. D., 1906, p. 445.

³ Sailer, Amer. Jour. Med. Sci., 1902, exxiii., p. 59; and Bernard and Jacob, Arch. Méd. exp. et d'Anat. path., 1903.

⁴ Archiv, 1904, lxxi., p. 191.

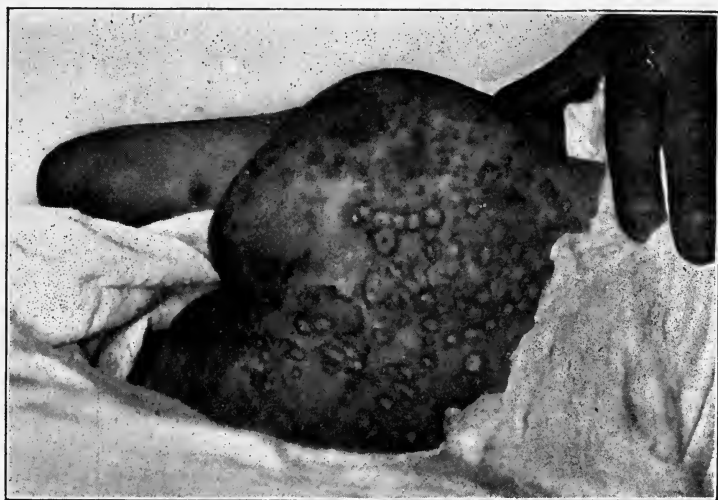
⁵ Annales, 1895, s. iil., vi., p. 213.

sue is of advantage in many cases. We have had the best results by careful attention to the general condition of the patient; by local asepsis; and by mummification of gangrenous tissue by continuous immersion in a solution containing five parts of the acetate of lead, twenty-five of crude alum, and five hundred of water.

DERMATITIS GANGRÆNOSA INFANTUM.¹

(*Multiple Disseminated Gangrene of the Skin in Infants, Vari-cella Gangrænosa, Pemphigus Gangrænusus, Rupia Escharotica, Gangrenous Infantile Ecthyma. Fr., Ecthyma térébrant.*)—As a consequence of the exanthemata (variola, varicella, rubeola, vaccinal eruptions) the head, shoulders, and trunk of some children exhibit crust-

FIG. 66.



Dermatitis gangrænosa infantum.

covered lesions which ulcerate and finally throw off a gangrenous, split-pea- to small-coin-sized, deep or shallow slough, after which repair commonly occurs. Severe losses are produced by a species of coalescence of smaller ulcers.

These gangrenous points may occur beneath some previously existing lesion or crust, or they may at the outset be spontaneous. In most cases there forms a vesicular lesion with rosy areola, that speedily bursts, leaving a blackish slough about which a circle of eliminating inflammation spreads. Thromboses result in the blood-vessels of the neighboring parts, œdema follows, and there is excited a train of reactive symptoms—fever, vomiting, diarrhœa, albuminuria, cardiac or pulmonary troubles. The patient becomes greatly emaciated. Crocker reports hemorrhagic vesicles and bullæ in grave cases.

¹Cf. Veillon and Hallé, *Annales*, 1901, s. iv., ii, p. 402 (with review of literature).

Brocq is careful to distinguish between these grave forms of disease and those to which should be denied the appellation *dermatitis gangrænosa*. In these milder forms vesicular lesions may develop, simulating those of varicella, occurring perhaps in crops and accompanied by a mild fever. Some among them may be covered with a blackish crust, may indurate at the base, surround themselves with

FIG. 67.



Dermatitis gangrænosa infantum. (Anthony.)

an angry zone of inflammation, and especially about the trunk, the thighs, and the anogenital region, ulcerate beneath the crust. Even though these ulcers coalesce and acquire a grave aspect, the result, as a rule, is not unfavorable.

The subjects of this affection are infants and young children, from three months to several years of age. Beside the exanthemata which may precede, cases are on record following tuberculosis, rickets, and syphilis. The process is one which, originally dependent upon the toxic effects of specific cocci, evidently requires a special soil for its effective operation.

Treatment.—The treatment should include support of the general system, with local antisepsis by the aid of boric-acid solutions, aristol,

iodol, and the dressing of the parts which slough by the usual deodorizing agents.

Prognosis.—The prognosis is at times grave.

SYMMETRICAL GANGRENE OF THE EXTREMITIES (LOCAL ASPHYXIA, RAYNAUD'S DISEASE).¹

This is a paroxysmal symmetrical asphyxia of the extremities occurring mostly in weakly anæmic young women of nervous temperament. There is usually a prodromal period during which the patient experiences intermittent abnormal sensations, for example, paræsthesia in different regions of the body, headache, and general malaise. These symptoms are especially marked in cold weather. The symptom-complex indicates a profound disturbance in vascular innervation.

A period of syncope may then follow; the phalanges become symmetrically pallid, bloodless, and the seat of intense pain. The disease may terminate with disappearance of these symptoms, or a stage of asphyxia may be reached. The affected fingers or toes may then change in color to a slate-gray or blackish color and fall into gangrene. The patient experiences great pain. These stages of the disease are not well marked in every case.

Etiology and Pathology.—This disease occurs equally in the two sexes and at all ages, and often in the cold weather of the winter season. There is a growing suspicion that many cases are of syphilitic origin, as the disease has followed specific infection. It has also succeeded tuberculosis, diphtheria, the exanthemata, diabetes, and hæmoglobinuria. It is apparently due to trophic disturbances, the exact nature of which has not been determined. By means of *x*-rays Beck² demonstrated in two cases atrophic and other changes in the bones.

Treatment is by employment of the galvanic current, stimulation (as in dermatitis with congelation), and friction with alcoholic, camphorated, or oleaginous lotions. It is desirable to apply both electricity and (in some cases) dry cupping over the spinal region. Systemic treatment should be adapted to the underlying condition in each case.

Prognosis is in some cases grave. When the morbid condition is limited to a small part of the body recovery is often satisfactory.

HERPES.

(Gr., *ἔρπειν*, to creep.)

(“FEVER BLISTERS.” *Fr.*, DARTRE; *Ger.*, FLECHTE, BLASCHEN-FLECHTE.)

The term “herpes” is responsible for some of the confusion which has existed with respect to cutaneous diseases. By the ancients

¹ For bibliography, see monograph by Monro, Glasgow, 1899, and chapter by Sée, *La Pratique Dermatologique*, t. i., p. 436.

² *Amer. Jour. Med. Sci.*, 1901.

it was employed, as its etymology suggests, to designate a disease creeping or extending gradually over the surface or within the substance of the skin. By several more modern authors the term is employed in a generic sense in a futile attempt to distinguish a series of so-called "herpetic diseases," and even herpetic diatheses from those of a different complexion. The significance which attaches to the word in the minds of dermatological authors of to-day is exceedingly simple, and is limited to the conditions described in the following paragraphs. Herpes zoster by some modern writers, is regarded as identical in character with herpes simplex. As excellent authorities can be cited on both sides of the question, the diseases are here separated for clinical study pending a definite demonstration of their relations the one to the other.

HERPES SIMPLEX.

Herpes simplex is an eruptive disorder, often first declared in the site of the lesions by sensations of heat and burning. These are speedily followed by the occurrence of millet-seed- to coffee-bean-sized vesicles (single or relatively few in number, and in the latter case grouped), which may be preceded or accompanied by a general febrile process, though in many cases there is no constitutional disturbance. The vesicles are usually displayed symmetrically, are short-lived, surviving but for a few hours, and are filled with a clear serous fluid which may become lactescent. After accidental or spontaneous rupture there is left a slightly tumid superficial excoriation, which is covered frequently by a light crust and at times is characterized by circumscribed hyperæmia, slight infiltration, or œdema of the base and periphery. The lesions rarely persist for more than a few days, and leave no permanent pigmentation or scar, unless complicated by pus-infection. The subjective sensations are not usually severe; they include moderate pain, itching, and heat.

Herpes Facialis, Herpes Febrilis, Herpes Labialis, "Cold-sores."—About the lips, the mouth, the cheeks, and the alæ of the nose, more rarely upon other portions of the face, lesions occur singly or in groups, possessing the characters described above. Their occurrence is usually sudden. Their frequency about the lips has suggested one of the titles under which they are most often described by authors. The tongue, the buccal membrane, the palate, and the larynx may participate in the morbid process; the lesions in such moist situations being represented by isolated or by grouped dark-grayish patches of epithelium that are sensitive and exfoliate. The functions of the mouth in articulation and mastication are thus rendered painful. Often the lesions coalesce, forming in an irregular line of elevated epidermis a pea-sized bleb, spread along the vermilion border of the lip and distended with clear serum. The burning and itching sensations which accompany the lesions are often marked and distressing. In the course of two or three days thin crusts form, the exfoliation

of which terminates the disorder. The disease is common in acute pneumonia and in malarial and enteric fevers. In these cases, as Kaposi has shown, the occurrence of the eruption by no means augurs favorably in every instance, as, nevertheless, a fatal result may follow. The connection between labial herpes and rigors has long been recognized, though particular attention has been directed to this relation by Hutchinson and Symonds. Trophic disturbances, traumatism, exposure to solar heat, unusual fatigue, a simple coryza, exposure to a draught of cold air, and temporary gastric disorders may suffice to induce the disease. There are patients who can produce the lesions at will by tickling the lips with a feather, and in some individuals there is an exquisite susceptibility to the disease. The disorder is always short-lived though often recurrent, and the superficial crusts which terminate the process are never followed by scars. Symmers, of Aberdeen, successfully cultivated a rod- or thread-shaped micro-organism (solid, filamentous, and without septa) obtained from the lymph in vesicles of herpes labialis.

Labial herpes should not be confounded with the symptoms of La Perlèche, described on another page. The disease to which the last name has been given in France is due to a parasite.

Epidemic Herpetic Fever.—Epidemic herpetic fever, which has been observed by Savage¹ and others, has prevailed in institutions in which young subjects are congregated. There are usually rigor, high fever, a coated tongue, adenopathy, and a vesicular rash over the face.

Generalized Herpes of French authors has been rarely seen in this country.

Herpes Progenitalis (*Herpes Genitalis*, *Herpes Præputialis*) is characterized by the appearance of one or a group of transitory vesicles, in men on the inner face of the prepuce, especially upon its upper limb, on the glans, on the balano-preputial sulcus or in the adjacent integument; in women, on the hood of the clitoris, the labia minora, the inner face of the labia majora, or adjacent surfaces even as far removed as the buttocks.

The disorder is seen most frequently in young adults and in early middle life, its occurrence after the age of fifty being unusual. There is commonly a precedent pruritus or a sensation of heat, sometimes very considerable pain, followed by the appearance of one or of several pinhead-sized vesicles seated upon a tumid and hyperæmic base. Within the preputial sac the lesions may either rupture at an early moment or assume the features above described as presented upon the mucous membrane of the mouth. The resulting œdema of the prepuce is often displayed in an annular tumefaction encircling the glans, while the labia minora perceptibly project from the general vulvar plane. In these localities the floors of ruptured vesicles are particularly liable to be irritated (coitus, caustic, etc.), and then pus and even blood may be exuded with much angrier excoriation and the resulting crusts be of darker shade. In the course of a few days

¹ J. C. D., 1883, i., p. 253.

even these crusts fall, and the disease is at an end. Successive crops of vesicles, however, may prolong the disorder for several weeks. Recurrence is common.

Rarely, a first attack of herpes in man results in an extraordinary sensitiveness of the balano-preputial membrane that persists for more than a year. The patients are often middle-aged men, married and virgin as to venereal antecedents. The membrane becomes tumid, tense, slightly glazed and dark red to dark purple in hue. Upon any undue sliding of the prepuce over the glans there occurs a very superficial fissure, whence a drop of serum oozes. The membrane becomes so sensitive that the passage of the finger over it is resented as though the conjunctiva had been touched. Unusual friction by the clothing or the use of a stimulating lotion is followed by intense pain and aggravation of symptoms and the price of coitus is several days' rest in bed.

THE DIAGNOSIS of herpes progenitalis is between chancroid and chancre. The latter will be manifested by its induration, its period of incubation, and its characteristic inguinal adenopathy. The chancroid, whether in pustular form or as an inoculated abrasion, is *ab origine* ulcerative in tendency, capable of auto-inoculation, and often accompanied by sympathetic, inflammatory, or virulent bubo of one side. Balanitis, with its puriform secretion and superficial patches of reddened epithelium, is readily distinguished from herpes progenitalis by its symptoms, though the two disorders frequently coexist.

The patient who exhibits a herpes of the genital region to-day may have been inoculated at the site of the lesion, which to-morrow or later may take on the chancreous modification. No individual with progenital herpes can be assured of immunity against syphilis until the longest period of incubation of the syphilitic chancre has elapsed since the date of the last suspected exposure.

Herpes progenitalis is almost universally the result of naturally or unnaturally induced sexual erethism or of congestion of the genitals from other causes. Its occurrence in an individual virgin as to such antecedents may be due to the causes efficient in the production of herpes facialis. In unusually sensitive persons it may be associated with dyspepsia, constipation, and the phenomena of the gouty state. It may follow any of the venereal diseases; or may be induced simply by filth. Though relatively rare in chaste women, it is of common occurrence in prostitutes. In some women it frequently accompanies menstruation (*Herpes Menstrualis*).

Diday and Doyon¹ believe that true herpes of the genital region is always of recurrent type, and well marked by its special course, career, and consequences. All others of a false type are divided by them into (1) an irritative form, seen in women as the result of vaginal discharges, sexual irritation, etc.; (2) a pseudo-membranous or diphtheroid form, also occurring for the most part in women, presenting vesi-

¹ Les Herpès génitaux, Paris, 1886.

cular and even bullous lesions the rupture of which is the signal for pseudo-membranous transformation; and (3) a neuralgic form, which is merely zoster of the genital region.

Pathology.—The eruptive phenomena are due to irritation of the nerves either directly or through reflex excitation. There is in many (probably in all) cases a localized peripheral neuritis of brief duration, involving the superficial nerves. The possibility of a microbic origin has been suggested.

Treatment.—The milder forms of herpes occurring about the lips and the genitalia require the simplest treatment. Sponging with pure water as hot as can comfortably be tolerated is often of value if followed by the local application of a weak lead solution, spirit of camphor, or solution of zinc sulphate 1 to 6 grains (0.066–0.40) to the ounce (30.). Alcohol or spirit of camphor applied locally will sometimes abort the disease. Equal parts of tincture of benzoin, alcohol, and glycerin is an effective combination. Duhring recommends highly the following:

℞	Zinc. sulphat.,	}	āā	Ḑj-3j;	1.33-4	
	Potass. sulphurat.,					
	Alcohol.,			3j;	4	
	Aquæ dest.,			3viij;	28	M.
Sig. Shake and apply freely and frequently.						

Bleuler states that a 1 per cent. ointment of cocaine gives prompt relief and shortens the course of the disease. On the lips, after rupture of the vesicles, the abraded surface may be protected by frequent applications of the compound tincture of benzoin. Crusts may be removed by the use of simple ointments, to which tincture of benzoin, 1 drachm (4.) to the ounce (30.), may be added with advantage. For lesions at some distance from the mucous surfaces, dusting-powders sometimes give relief; or if the lesions be few in number and be seen before rupture of the vesicles, the latter may be sealed completely with several layers of collodion, beneath which the lesions rapidly dry and disappear.

Occurring upon the genital region, the lesions are to be protected by the interposition of a pledget of lint, or a borated or salicylated dusting-powder. As a rule, ointments are unsuited for the moist mucous surface of the genitals, the malodorous emanations from most diseases of such parts being retained by all grease-containing compounds. Lotions answer far better, and they may be made stimulant with alcohol; astringent with tannin, zinc sulphate, or cupric sulphate; anodyne with opium or cocaine; and antiseptic with formalin, carbolic acid, or corrosive sublimate. Prophylaxis by the local use of aromatic wine, or tannin and brandy, with a sexual hygiene that will prevent congestion of the genitals, is a matter of importance. In cases in which recurrences continue it is necessary to investigate the general health of the patient and correct whatever defects may be found. Arsenic is occasionally of value in preventing recurrences.

HERPES ZOSTER.¹(Gr., ζωστήρ, a girdle; Lat., *cingulum*, a girdle.)

(SHINGLES, ZOSTER, ZONA, IGNIS SACER, HEMIZONA. Ger., GÜRTELFLECHTE, GÜRTELAUSSCHLAG. Fr., ZONA.)

Symptoms.—The eruption in herpes zoster usually is preceded, for a period lasting from a few hours to days and even weeks, by hyperæsthesia, pruritus, and neuralgic sensations of moderate or of severe intensity.² These sensations usually are limited to the area of the integument subsequently or coincidently displaying cutaneous lesions; but there are exceptions to this rule, as at times the pains are experienced elsewhere. Often, though limited to the region about to be attacked, the pain occurs where it is experienced in other neuralgias, at the points indicated by Romberg as corresponding with regions in which cutaneous branches are given off by the nerve-trunks. There may be mild constitutional disturbance in the form of malaise or febrile symptoms. Adenopathy occurs frequently in the neighborhood of the eruption, and may be generalized.

The lesions of zoster in from two to a dozen or more irregularly shaped groups, commonly are arranged along the cutaneous distribution of a single nerve. These groups are separated by areas of normal integument, show little tendency to coalesce, and may be widely scattered. Aside from the few exceptions which prove the rule, zoster occurs but once in the lifetime of an individual, and is limited to one side of the body.

According to Fabre, the essential lesion, always present even when vesicles are not seen, is the first macular efflorescence of the disease in the form of brilliant or dull-red, poorly defined, erythematous macules, groups of which appear in the tract supplied by the affected nerve. As the patient rarely presents himself for treatment until after the appearance of vesicles, the macules usually escape observation, either having disappeared or having been overlooked. The vesicles or vesico-papules which are generally regarded as more characteristic of the disease, appear afterward in from a few hours to a day or more, spring from the macules or from the normal skin, and are accompanied by a sensation of heat. These typically perfect, isolated vesicles vary in size from that of a grape-seed to that of a coffee-bean. They appear in successive groups of from eight to a dozen or more, which gradually increase in size and attain maturity simultaneously in from three to seven days.

The lesions, when fully developed, project well from the widely hyperæmic base from which they spring, are tense from complete distention, and have no tendency to spontaneous rupture so firm is their roof-wall. Later their early limpid contents become lactescent or

¹ For complete bibliography, see Blaschko's article in Mraček's Handbuch, Bd. i., p. 713.

² Bettmann, Pruritus als Initialerscheinung des herpes zoster, Deutsche med. Wochenschr., 1906, Nr. 19; Cutan., abs. 1907, xxv., p. 43; lxxxvi.

puriform in character. Occasionally they develop into blebs; and may contain pus or blood. When abundant the vesicles may coalesce and form irregular patches. Involution is accomplished by desiccation and the formation of a yellowish-brown crust, which falls in from seven to ten days after the first appearance of the vesicle. New groups appear during a period usually of from six to twelve days, at the end of which time vesicles may be seen in all stages of development and involution. The average duration of the disease is from ten days to three weeks. Exceptionally, a succession of new lesions may prolong the disease for a month or more.

Disappearance of the vesicles and crusts is followed often by pigmentation, which may persist for weeks or months. Scarring occurs in some cases, especially if the vesicles have been ruptured and exposed to pus-infection. The scars left by zoster are characteristic. Not only are they limited to the original seat of the disease, but they have also a peculiar indented look, as if made by a nail-set and hammer. They are angular in outline, and do not exhibit the dead-white color of many cicatrices.

The pain or hyperæsthesia of zoster varies greatly in intensity and in duration. It is usually mild, but may be very severe, especially in old people. It disappears commonly with, or soon after, the appearance of the eruption, but may persist for months or even for years.

Zoster occurs chiefly in the upper part of the body, and, though limited to one side, this limitation is rarely observed exactly at the median vertical line, as a few lesions can usually be seen extending beyond this boundary. The young subjects of the disease are usually between the thirteenth and fourteenth years of life; though children of five, eight, and ten years have been attacked.¹

Atypical forms of zoster occur. The vesicles may be typical and few in number, possibly limited to a single group, or they may be abortive and transitory. Papules or vesico-papules may be the sole lesions. The vesicles may become transformed into pustules or bullæ, or be filled with blood from capillary hemorrhage, producing bluish or blackish lesions, known as ZOSTER HÆMORRHAGICUS, or "black herpes." In severe cases there may be ulceration and gangrenous or deep-seated phlegmonous inflammation. Keloid-like scars occur rarely.

Recurrent zoster² is relatively rare, but more than a score of cases are reported in which an individual had two or more attacks either in the same or in different regions of the body. In many of the cases reported, however, the recurrent lesions were not typical of true zoster. Some of these are unquestionably of traumatic origin.

Zoster of simultaneous occurrence on two sides of the body may be symmetrical or asymmetrical of development. The disease in

¹ B. J. D., 1905, xvii., p. 199.

² For a *résumé* of the literature cf. "Recurrent Zoster," by Joseph Grindon, J. C. D., 1895, xiii., p. 191. Also Vorner, *Annales*, 1906, s. iv., vii., p. 888.

either form is exceedingly rare. In our experience the anomaly is generally the result of herpes either in a syphilitic subject or in one under the influence of arsenic. T. C. Fox¹ reports a symmetrical case in an infant of five months.²

The eruption may occur over the terminal filaments of nerves which have no communicating branches, unless, as suggested by Blaschko,³ there be an interlacing of fibres in the spinal cord.

In explanation of the difference in the clinical symptoms of many recorded cases of zoster, authors have attempted to distinguish between the types of the "true" disease, and others produced by trauma, by arsenical and other medicamentous ingesta. In this way it has been attempted to explain not merely the epidemics of the disease of the kind described by Kaposi, Lange, and others, but also the cases apparently infectious, where as in the instances observed by Paggi, Pudor, Neisser, and others one individual seems to have transmitted the malady to another. Thus Bärensprung, Jarisch, and others believe that idiopathic Zona is a zosterian malady *sui generis*, and not to be confused with the traumatic and medicamentous types. Occasionally in the course of an acute zoster, a generalized eruption of vesicles occurs,⁴ and this with fever, hæmaturia, and other signs by grave systemic infection.

Anomalous nervous symptoms are: persistence of neuralgia after involution of the cutaneous lesions; neuralgia of an intense and intolerable severity at any period of the disease; painful anæsthesia of the skin; paretic and paralytic phenomena with resulting muscular atrophy; and, in zoster of the head, keratitis and iritis, complete destruction of the ocular globe, and falling of teeth and hair.

Observers are not in agreement as to the question whether the form of herpes designated as simplex and that termed zoster should be considered as one or separate affections. Of the former opinion are the 13 authors cited by Sachs, including the names of Bärensprung, Kohn, Neisser, Finger and others whose names might be added. On the other side a long list of authors might be adduced, including Hebra, Kaposi, Unna and Neumann, who hold to the total separation of the two maladies. At present facts sufficient to incontestably decide the question are wanting. Clinically, the disorders are by most authors definitely distinguished the one from the other.⁵

Sachs has contributed a valuable paper on the subject of the *epidemic of zoster* observed in Breslau in 1901 (69 cases).⁶

According to the regions involved the following types of zoster are generally recognized:

ZOSTER CAPILLITII depends upon involvement of the second

¹ B. J. D., 1898, x., p. 252.

² See also Kraus, Centralbl., 1905, viii., p. 226.

³ Monatshefte, 1898, xxvii., p. 175.

⁴ Beyer, Monatshefte, 1906, xlii., p. 415.

⁵ See Schamberg, Archiv, 1908, lxxxix., p. 138; J. A. M. A., 1907, xlviii., p. 746.

⁶ Zeitschrift. f. Heilkunde, 1906, F. 12, V. 25; Rev. Prat. d. Méd. Cut. Syph. et Vén., Nos. 1 and 2, 1907, Jan., pp. 9 and 219, full bibliography to 1904. The author, however, recognizes no distinction between herpes simplex and herpes zoster.

branch of the fifth pair of nerves, and its lesions occupy the anterior and posterior portions of the scalp.

ZOSTER FRONTALIS occurs in the area supplied by the supra-orbital nerve, which springs from the first branch of the trigeminus. Its lesions extend from the upper eyelid to the vertex, and spread in a fan-shaped figure over one-half of the brow, forehead, and scalp.

ZOSTER OPHTHALMICUS may be a severe and dangerous manifestation of the disease, being often complicated by agonizing neuralgia, formidable involvement of all parts of the eye, even resulting in panophthalmia, ulcerative keratitis, pyæmia, meningitis, and death. Typical cases of zoster of this region may not, however, exhibit a single untoward symptom of the disease.¹

ZOSTER FACIALIS depends upon involvement of the sensory nerve-fibres of the trigeminus distributed to the face, its lesions being displayed over one cheek, the side of the nose, the half of the lip or of the chin. The facial and seventh nerves may chiefly be affected. Care must be taken in cases of this variety not to confound the disease upon the nose with acne or with painful tertiary syphilitic lesions, errors in diagnosis that have occurred. When the lower jaw is involved there may be severe toothache, dysphagia, and fall of the teeth, with great resulting deformity.

ZOSTER NUCHÆ, seu COLLARIS, occupies the region extending forward from the cervical vertebræ to the clavicle, or upward toward the occipital region and the auricle.

ZOSTER BRACHIALIS occupies the region from the last cervical and first dorsal vertebræ over the supra-spinous scapular region and the contiguous portions of the upper arm. Rarely, even the skin of the fingers and that over the first and second ribs are involved. It is a common and usually a mild form of the disease, and is characterized by a peculiar isolation of the vesicular groups. It occurs also with lesions of exclusively brachial distribution. Thomson, of London, reports brachial zoster with involvement of the right internal cutaneous nerve in which two groups of vesicles appeared in the palm of the hand.

ZOSTER PECTORALIS is the most frequent form of the disease, from which the common name "shingles" originated. The eruption occurs below the first dorsal vertebra, covers the skin of the thorax as far as the lumbar vertebræ, and extends from the spinal column behind to the sternal region in front. Two, three, or more of the intercostal nerves in this region are commonly involved, and the neuralgia resulting has frequently been mistaken for the pain of pleurisy. Children more often display this form than any other variety of zoster.

ZOSTER ABDOMINALIS.—The area here involved extends from the lumbar vertebræ to the median line of the abdomen. Zoster abdomi-

¹ Osterroht, Herpes zoster ophthalmicus, Carl Marhold, Halle a. S., 1907; Monatshefte, 1907, xlv., p. 46.

nalis is usually much less pronounced in its features, and the exanthem is less abundant, than in the variety of the disease just described. When constipation exists defecation may be attended with considerable pain.

ZOSTER FEMORALIS covers the buttocks and sacrum, and extends along the thighs, sweeping from behind forward and from above downward as far as the popliteal space; in some cases involving the leg and foot. The penis, the scrotum, the labia, the vestibulum vaginae, and peri-anal region may then exhibit unilaterally arranged vesicles. As this is a relatively rare manifestation of the disease, the diagnostician will do well to recall the possibilities in every case of an exanthem limited to one side of the perineum, supposed to be the seat of genital eczema.

Etiology.—Herpes zoster occurs in both sexes, and in the young as well as in the old, though it is rarely seen in infants. It shows a tendency to increase in severity with the age of the patient, especially after middle-life. It is influenced by the seasons, as cold and damp weather serves to increase its frequency in those susceptible to it. Frequently there is a history of recent exposure of the involved region to a draught of cold air. Many other depressing agencies are named as effective in the production of zoster. Among them are certain poisons (carbon dioxide, belladonna, and atropine), pyæmia, carcinoma, fever, measles, pulmonary inflammations (including phthisis), septicæmia, hemorrhages, traumatism, malaria¹ puerperal eclampsia² and spinal injections.³ It also has followed vaccination, the passage of electrical currents, the extraction of teeth, an accidental prick by a thorn, the tapping of hydatids, and gunshot-wounds of the body. Curtin⁴ reports ten cases in which zoster accompanied inflammation of serous membranes. Inasmuch as no one of these causes can be cited as certainly effective in all cases, it can merely be said that any influence sufficient to induce inflammation of a sensory nerve or its ganglion may be followed by the objective signs of the disease.⁵ In numerous instances zoster has followed a prolonged course of arsenic. Occasionally zoster occurs in epidemics, or coexists with other epidemic disorders, such as influenza and varicella.⁶ The evidences of direct contagion in a few instances are very strong. These facts, and the rarity with which zoster recurs in the same individual, together with the adenopathy which is often present at the beginning of an attack, favor the growing belief that zoster is, in some instances at least, an infectious disease.⁷

¹ Cf. Winfield, N. Y. Med. Jour., 1902, lxxvi., p. 191.

² Archiv, 1907, lxxxiii., p. 147.

³ Pantner and Simon, Annales, 1908, s. iv., ix., p. 124.

⁴ Amer. Jour. Med. Sci., 1902, exxiii., p. 264.

⁵ Seventeen observations of arsenical zoster are cited by Sachs (l. c.); three produced by carbonic oxid, and the others by absorption of morphia, cocaine, corrosive sublimate, and antipyrine.

⁶ Corlett, J. C. D., 1905, xxiii., p. 289.

⁷ Hay presents an excellent argument in favor of the infectiousness of zoster, and gives references to literature on the subject. J. C. D., 1898, xvi., p. 1.

Pathology.—In some cases there is unmistakable evidence of a descending interstitial neuritis, but the affection may be associated with irritative action in any portion of the nervous tract from central to peripheral limit. The researches of Bärensprung, Rayer, Wagner, Charcot, Kaposi, and others have demonstrated with sufficient clearness that in zoster there are always pathological changes at some point in the corresponding nervous tract (cerebral or spinal centres, ganglia, or the nerves themselves). In the majority of cases in which a pathological lesion is demonstrated there is found an interstitial neuritis of the posterior ganglion or of the posterior spinal root, but neuritis and perineuritis of the peripheral nerves, without change in the more centrally situated parts of the nervous system, are reported by competent observers. In a number of cases multiple neuromata have been discovered along the affected nerve, the spinal cord and ganglia remaining normal. In other instances the irritation of the nerve-tract has been due to hemorrhage, degeneration, or pressure from tumors, etc.

Head and Campbell¹ have been able to make post-mortem examinations in twenty-one cases. They found inflammatory and secondary degenerative changes not only in the ganglia of the posterior roots, but also in the posterior roots themselves, in the root-fibres of the posterior columns, and in the peripheral nerves. Reflex irritation seems to have been an effective cause in a few cases.

According to Biesiadecki and Haight, the cutaneous lesions originate in the deeper portions of the rete, precisely as in other vesicular disases. The exudate from the hyperæmic corium, especially its papillary layer, presses upward into the rete, the epithelia of which are thus separated and vertically elongated, the lacunæ between them being distended with serum and a few round cells. Often the vesicles form about the hair-sacs. As the exudation increases the rete-cells are progressively separated, and finally are discovered free in the exuded fluid, though some, in changed form but still united to each other, may be found in the upper part of the vesicle. Except at the margin, the mucous and horny layers are separated by the exudation. At first many-chambered, with delicate, easily ruptured partitions, the vesicle represents finally a single chamber filled with serum containing rete-cells and a few pus-cells, the latter increasing in number as the vesicle changes its type. Its base at first rests upon the lower portion of the mucous layer; later, upon the corium itself, in which all signs of papillæ are absent. In the vicinity of the vesicle the papillæ and corium are infiltrated and the vessels are dilated, but these inflammatory changes do not extend far into the corium. The deep location of the vesicle, resting as it does upon the papillary layer, accounts for occasional destruction of the papillæ and consequent scarring.

The vesicle of zoster (and to a less degree that of variola and of varicella) is peculiar in that it contains in the deeper portion and

¹ Brain, 1903, xxiii., p. 362 (monograph, well illustrated).

along the walls epithelial cells which have undergone transformation into round or ovoid globular bodies, usually larger than the normal cells, which have apparently a limiting membrane or double-contoured wall, and contain from two to a dozen or more rounded bodies. These transformed epithelial cells have been described as protozoa, but their true nature has been demonstrated by Unna, Gilchrist,¹ and others. Other varied and extraordinary figures are seen. Among them are rings with fragmentary edges and swollen centres (the edge representing a homogenized and fibrinously degenerated protoplasm; the centre a homogenized nucleus). Elsewhere are thin and expanded shells filled with epithelial nuclei. Irregularly "ballooning" balls, baskets, tubes, hanging cords, and other odd forms take the place of the trabeculæ found in other vesicles. Unna names this peculiar change in the epithelial cells a "ballooning degeneration," to distinguish it from the reticulating forms. Kopytowski² states that these forms are due to an oedematous degeneration (views based on an examination of sixteen cases). Pollitzer³ reports an unusual case in which the vesicles were limited to the rete Malpighii of the hair-follicles.

Diagnosis.—The vesicles of herpes zoster are not rarely confounded with those of eczema; but the distinction between the two is always readily established. In eczema there is itching but no neuralgia; the vesicles tend to rupture spontaneously and never persist as they do in zoster; eczematous lesions are also smaller, more acuminate, and rarely distinctly limited to the lateral half of the body. Herpes simplex is frequently recurrent, herpes zoster rarely; herpes simplex is exceedingly liable to spread around the mucous outlets of the body, and on either side of the latter, while zoster reaches such regions only after extension from other parts, and is then almost invariably monolateral. Its lesions are, moreover, never grouped in the concentric circles of herpes iris.

Treatment.—The purpose of local treatment of herpes zoster is to protect the vesicles from rupture and infection, and to relieve pain. These ends are best accomplished by thickly dusting the lesions with an anodyne powder, such as Anderson's powder, containing morphine sulphate, 2 grains (0.133) to the ounce (30.); lycopodium with powdered opium, orthoform, and boric acid, or zinc stearate with acetanilid, etc. The vesicles may be punctured with an aseptic needle and the contents evacuated, but rupture of the lesions should not be permitted. Over the entire affected surface should be laid gently a sheet of soft lint or of antiseptic cotton, its meshes being also filled with the powder, and a bandage, when practicable, smoothly bound over the whole. In the milder cases nothing more than this treatment is needed from first to last. Collodion and the glycogelatins furnish a convenient and effective dressing if the contents of the vesicles be

¹ Johns Hopkins Hosp. Rep., 1896, vii., p. 138.

² Archiv, 1900, liv., p. 17.

³ J. C. D., 1903, xxi., p. 73.

first evacuated and the surface rendered as nearly aseptic as possible. In cases in which the lesions have ruptured and their bases have undergone erosive or ulcerative changes, oleated lime-water with zinc oxide, belladonna, and opium or morphine should be applied, and be covered with Lister protective. Carbolated and anodyne ointments may also be used, especially toward the conclusion of the case. Bleuler¹ states that applications of 1 part of cocaine in 50 parts each of lanolin and vaselin not only relieve the pain, but also shorten the duration of the disease.

Lotions of carbolic acid and glycerin (1 part to 6), or lead-water and laudanum, or the "lead-and-opium wash" may be employed. Van Harlingen recommends $\frac{1}{2}$ ounce (15.) each of precipitated zinc carbonate, powdered zinc oxide, powdered starch, and glycerin, shaken up in $\frac{1}{2}$ pint (240.) of water.

Duhring speaks well of collodion with morphine, in the strength of 10 grains (0.66) to the ounce (30.). Kaposi warns against the use of diachylon ointment. Generally, it may be said that ointments should be the last resort, but those containing from 10 to 20 grains (0.66–1.33) of the aqueous extract of opium or of belladonna to the ounce (30.), or a 5 per cent. cocaine salve, will at times give relief from pain. The oleate of cocaine and menthol have been used locally with great advantage in meeting the same indication. Alcohol; or resorcin 2 parts, alcohol 100 parts; or 1 per cent. alcoholic solutions of menthol or of thymol, may be useful when other measures fail, and it is claimed by some that these remedies will abort the disease if used early. A continuous galvanic current of between two and three millampères may be applied over the root of the nerve two or three times daily for ten minutes at a sitting; or the high frequency current over the nervous centre responsible for the disease, or spraying with ethyl chlorid.² Blistering or dry-cupping, or in sthenic cases wet-cupping, may be employed instead of electricity.

No remedy for internal use is known to have the power of aborting or of shortening an attack. Quinine is certainly indicated and does no harm, but quinine and strychnine in full doses have alike proved inefficacious. Other remedies employed are zinc phosphide in $\frac{1}{3}$ grain (0.022) doses, repeated every three hours, and, if indicated, in combination with $\frac{1}{6}$ (0.011) grain of the extract of nuxvomica; arsenic (Kaposi); and the tonics in general. Anodynes, by mouth or by hypodermatic injection, are often indispensable. Inasmuch as many patients consider the attack a trivial matter, it is of some consequence that they be warned of the possibilities of the future and that they be confined to an apartment of equable temperature in which they are not exposed to atmospheric changes. This measure is of special importance in the zoster of the face. A skilled oculist should be consulted in cases involving the eye.

¹Neurologisches Centralblatt, 1899, xviii., p. 1010.

²A. Gregor-Penryn, Brit. Med. Jour., 1905, xli., p. 651. Morrow, J. C. D., 1905, xxiii., p. 157.

Prognosis.—Zoster usually runs a benign and self-limited course. The prognosis in exceptional cases may be in the highest degree grave. Many severe cases have occurred in which patients, after years of intense suffering, have resumed the occupations of life, physical wrecks of their former selves, their faces indented with scars, and the vision of one eye impaired or ruined. Rarely the termination is fatal.

DERMATITIS HERPETIFORMIS.¹

(HERPES CIRCINATUS BULLOSUS [E. Wilson], HERPES GESTATIONIS [Milton, Bulkley, and others], PEMPHIGUS [Klein], PEMPHIGUS CIRCINATUS [Rayer], HERPES PHLYCTÆNOIDES [Gibert], HERPES IRIS [Jarisch], FATAL PEMPHIGUS-LIKE DERMATITIS [Mayer], PECULIAR SKIN-ERUPTION RECURRING DURING PREGNANCY [Oswald], BULLOUS ERUPTION OF A PECULIAR CHARACTER [Leigh], HYDROA [Jones and Bulkley], DUHRING'S DISEASE, HYDROA HERPETIFORMIS. *Fr.*, MALADIE DE DUHRING, DERMATITE POLYMORPHE [Brocq], PEMPHIGUS COMPOSÉ [Devergie], PEMPHIGUS AIGU PRURIGINEUX [Chausit], PEMPHIGUS PRURIGINEUX [Hardy].)

Dermatitis herpetiformis is a somewhat rare cutaneous affection, commonly subacute or chronic in career, at times with systemic disturbance of a mild or serious type, characterized by the production upon the skin, of vesicles, pustules, blebs, or papules, often in multi-form combination, usually grouped, often accompanied by pigmentation, producing excessive pruritic and burning sensations, frequently recurrent, and rebellious to treatment.

Dermatitis herpetiformis is a malady which, in one form or another and under different titles has long been recognized and described. The credit, however, of clearly establishing its identity,

¹ Duhring: "Dermatitis Herpetiformis; its Relation to So-called Impetigo Herpetiformis," *Amer. Jour. Med. Sci.*, October, 1884. "Dermatitis Herpetiformis; Case of, Caused by Nervous Shock," etc., *ibid.*, January, 1885. "Case of Dermatitis Herpetiformis, Illustrating the Pustular Variety of the Disease," *J. C. D.*, i., No. 8. "Case of Dermatitis Herpetiformis with Peculiar Gelatinous Lesions," *Med. News*, March 7, 1885. "Notes of a Case of Dermatitis Herpetiformis," etc., *N. Y. Med. Jour.*, November, 1884. "A Case of Dermatitis Herpetiformis (Bullousa)," *ibid.*, July, 1884. *Cf.* Duhring, p. 436. See also: Unna, *Monatshefte*, 1889, ix., p. 97. Brocq, *Annales*, 1888, s. ii., ix., pp. 1, 65, 133, 209, 305, 433, 493. Gaucher et Barbe, *Annales*, 1896, s. iii., vii., p. 64. Corlett, Recurrent bullous eruption limited to certain areas, *Tr. Amer. Derm. Ass.*, May 31, 1898. Tenneson-Lyon, *Annales*, 1888, s. ii., ix., p. 328. Darier, *Annales*, 1896, s. iii., vii., p. 842. Thilliez, *Thèse de Paris*, 1895. Kromayer, *Derm. Zeitschr.*, July, 1897, p. 475. Leredde, *Annales*, 1895, s. iii., vi., pp. 281, 369, and 1896, s. iii., vii., p. 846. Triboulet, *Id.*, 1892, s. iii., iii., p. 272. Radcliffe-Crocker, *Brit. Med. Jour.*, May 22, 1886, p. 966. *Diseases of the Skin*, 1898. Dubreuilh, *Annales*, 1892, s. iii., iii., pp. 50 and 353. Jamieson, *Dermatitis herpetiformis*, *B. J. D.*, March, 1898, p. 75. Fordyce, *J. C. Gen.-Urin. D.*, Nov., 1897. Bulkley, *American Jour. of Obst.*, Feb., 1874, vi., p. 580. Fox, *Archiv*, 1880, vi., p. 16. Duhring, *The Medical News*, July 19, 1884. Fournier, *Bull. Médical*, 1892, p. 1179. Melot, *Thèse de Paris*, Dec. 19, 1894. Chas. Perrin, *Thèse de Paris*, 1895, p. 59. Bar and Tissier, *Bull. et Mém. de la Soc. Obstetr. et Gynecol. de Paris*, Feb., 1895.

and of recognizing one process as differently described in the several observations of others, is due to Duhring, of Philadelphia.

Symptoms.—Constitutional symptoms may be slight or wanting but the first appearance of the disease and the succeeding attacks or exacerbations frequently are announced by malaise, sensations of chilliness, decided rigors, or alternations of cold and hot sensations, with systemic disturbances. The skin usually is the seat of pruritic or of burning sensations, followed in the course of from twelve hours to two days by the appearance of the exanthem, which may be macular, papular, tubercular, vesicular, pustular, or bullous in type, very rarely purpuric; or multiform combinations of these lesions may recur in every variation. The lesions may be cutaneous, muco-cutaneous, or mucous in situation, and often are disposed symmetrically.

The macular form of eruption appears in small-coin- to palm-sized patches, irregularly rounded, coalescing, well or ill defined as to outline, and slightly raised, suggesting the lesions of erythema multiforme or urticaria. Often there are formed infiltrated areas of a vividly red hue on which other lesions are developed. Imperfectly defined maculo-papules, papules, and papulo-tuberculous lesions, varying in shape, size, and firmness, may also spring from or be intermingled with the reddish maculations described above.

In typical development, however, the disease presents vesicular symptoms of herpetic type. Flat, slightly elevated, hard, angular, irregularly outlined vesicles may appear, pinhead- to bean-sized, and tensely distended. They may be pale yellow or darker in color and without or without areolæ. When bullæ form they may be sparse or be plentiful, and be bean- to egg-sized, with cloudy, lactescent, hemorrhagic, or purulent contents. Pustules when present are single or are clustered, pinhead- to bean-sized lesions, flat, each surrounded by a livid areola.¹ When evolution is complete, segments of rings, or distinct rings, of new minute or large pustules surround those first formed, and in less than a week these rupture and become covered with a crust, which is flat, adherent, and yellowish, greenish, brownish or blackish in color. When there is coalescence a large coin-sized pustule and crust may result, and even extensive patches of these coalesced lesions may form. The lesions may number from a score or fewer to hundreds. A portion or all of the cutaneous surface may be involved.

The imprint of the cutaneous symptoms is multiformity, recurrence, and variation in type from one efflorescence to another. Vesicles, pustules, and bullæ without order or regularity of evolution or of recurrence appear at one and the same time, in rapid or in slow succession, and, without fixed intervals of appearance, for months at a time. Generally, however, a prevalence of one special type of lesions may be noted during a single period of outbreak or of recurrence. This prevalence is in the direction generally of lesions of

¹ Cf. Wende and Pease, "A Case of Dermatitis Herpetiformis, Illustrating an Unusual Pustular Variety of the Disease," J. C. D., 1901, xix, p. 171.

an herpetic type, viz., the vesicular and the bullous in groups, though less frequently one of the other types may predominate, and rarely vesicles may be absent. The surface may be invaded partially or generally; often only the trunk and extremities are involved. Occasionally vesicles and blebs are filled with blood.

As a result of the conditions described above a peripheral new formation of lesions tends to produce marginate patches in which grouping occurs, the groups, however, being interspersed with diffusely disseminated lesions of various types. The irregular, angular, or stellate forms of the lesions containing fluid are highly suggestive. Pigmentation and infiltration of the skin are commonly noticed. The subjective sensations of burning increase and diminish as cutaneous lesions are multiplying or are disappearing. The pruritus is in some cases more severe than in eczema, and the traumatism of scratching add greatly to the multiform features of the disease.

The disease lasts for months and even for years. Duhring reports cases lasting from five to fifteen years, with periods of relative or of entire immunity. In one of Duhring's cases there were thumb-nail-sized, raised but flat, golden-yellow-colored lesions, of firm consistency, containing a similarly colored, thick, consistent, gelatinous pulp; these features have been noted in other instances.

When the oral cavity is invaded there appear upon the sodden and macerated mucous surface pustules and bullæ, which rupture, leaving raw and unhealthy-looking erosions, even sloughing patches of mucous membrane. Crusts form about the nares and the lips, and the stench from the patient is intolerable. In the same way the vulva, the anus, and the prepuce may be surrounded by vesicular and bullous lesions, which form also on the mucous surfaces adjacent and pursue a course similar to that recognized in the mouth.

In grave cases, as the skin symptoms exhibit a marked aggravation the systemic condition changes for the worse. Crusting, lymphangitis, adenopathy, lichenification may be the results of scratching and secondary infection of the skin. After a low fever alternating with chills and accompanied by progressive cachexia and emaciation, an intermittent diarrhœa or a pneumonia may close the scene. The repulsive appearance of the patient at the last, in severe cases, is as formidable as in fatal cases of confluent variola or of severe pityriasis rubra.

Complications of all forms of dermatitis herpetiformis are: the involvement of the nails, which may be shed; the occurrence of scars only after secondary infection of lesions and ulceration; vegetations, as in pemphigus vegetans; marked cachexia; and, lastly, serious disturbance of the nervous system in consequence of long-continued anxiety as to the health and distress produced by the eruptive symptoms.

Etiology.—The disease occurs in both sexes and at all ages, but somewhat more commonly after adult years have been attained; often in individuals of neurasthenic type or in those in whom the nervous

PLATE X



Dermatitis Herpetiformis.



system has been subjected to unusual strain. Mental crisis, nervous shock, fright, anger, menstrual irregularities, pregnancy, the puerperal state, septicæmia, phimosis, physical fatigue, exposure to cold, and defective renal excretion have all been cited as causes of the malady. It is possible the irritation of the nervous system may be due in every case to a toxæmia, but by many the disease is considered purely a neurosis.

Pathology.—Histological examination shows an acute inflammation in the upper part of the corium, chiefly in the papillary layer. There are dilatation of the vessels, diapedesis, marked œdema with infiltration of the lymph-spaces, and some plasma-cells. The vesicles are formed rapidly as a rule between the basal layer of the rete and the papillary body. Larger vesicles are formed frequently by the confluence of smaller ones, and they all are filled more or less with a fine or coarse network of fibrin containing polymorphonuclear with some mono-nuclear and eosinophile cells, red blood- and epithelial cells and also coagulated albumin. The eosinophiles are found in the vesicles and in the blood-vessels and lymph-spaces of the corium, and frequently between the epithelial cells. The deeper portion of the corium is unchanged for the most part. Eosinophilia is present as a rule, but its exact significance is not established, as it is found in other conditions. Lerrede¹ would include in this category, on the basis of the pathological anatomy of the disease, the pemphigus vegetans of Neumann.²

Diagnosis.—The diagnosis in classical cases is made readily; in others the distinction between dermatitis herpetiformis, impetigo herpetiformis, and certain forms of pemphigus is exceedingly difficult. It is possible that between the three there may be transitional forms scarcely to be assigned to the one category or the other. The same is true of certain exceptional varieties of erythema multiforme. In pemphigus, as a rule, the lesions are more uniformly larger and rarely beset with small vesicles and pustules. The itching is less prominently a feature of the disease.

The diagnostic features of the disease are: chronicity, with or without remissions or intermissions; multiformity of the lesions, among which those of herpetic type usually predominate; the tendency of the lesions to appear in groups or patches; the very marked capriciousness and variableness of the recurrences and exacerbations in their times of appearing, and in the nature, extent, and severity of the lesions; itching, often intense; and more or less pigmentation.

Treatment.—Internal treatment has been directed to meet the indications presented. Of great importance are hygienic measures with a view to maintaining the patient's general health. All excesses,

¹ *Annales*, 1899, s. iii., x., p. 836. *Monatshefte*, 1898, xxvii., p. 581.

² For a full discussion of the relation of this disease to allied vesicular and bullous dermatoses, cf. articles by Jamieson, B. J. D., 1898, x., pp. 73 and 118; Brocq, *Annales*, 1898, s. iii., ix., pp. 849 and 945; and his valuable and amply illustrated chapter in *La Prat. Dermat.*, Paris, 1900, t. i., p. 651; and Lerrede, *Monatshefte*, 1898, xxvii., p. 381.

excitement, and everything tending to interfere with the equilibrium of the nervous system should be avoided. A nutritious but simple diet, regular habits of living, with sufficient outdoor life and exercise, are all of great value. Medication is directed chiefly toward improving the tone of the nervous system, for which purposes strychnine, quinine, iron, small doses of arsenic, and phosphorus may be used. Preparations of malt and cod-liver oil are often indicated. Mild laxatives, and the free drinking of water between meals and before meals, are of value in aiding elimination. For the same purpose small doses of mercurous iodide may be continued for weeks at a time. Stelwagon has found general galvanization of value in one or two patients. In exceptional cases arsenic in full doses acts almost as a specific; it is of most value in vesicular and bullous eruptions. It should be remembered that when arsenic is not suited to a given case large doses of the drug may do much harm. Crocker prefers salicin in 15 grain (1.) doses.

Other existing disturbances of the general economy due to rheumatic tendencies, kidney-disease, indigestion, constipation, or other cause should be recognized and properly be treated.

Locally treatment is directed to keeping the surface clean and aseptic, and to making the patient comfortable. Duhring recommends stimulating applications when they are well tolerated, but in many cases soothing and sedative preparations are necessary. Among the stimulating applications which have proved of value may be mentioned lotions and oils containing tar, carbolic acid (1 to 20 per cent.), ichthylol (2 to 10 per cent.), and thymol (1 to 5 grains (0.06–0.33) to the ounce (30.)). Stelwagon recommends liquor carbonis detergens in strength varying from 1 to 10 parts of water up to the pure solution. Duhring found weak sulphur ointments (2 grains (0.13) to the ounce (30.)) of value in cases in which there were vesicular, pustular, and bullous lesions. This ointment should not be rubbed in vigorously, but should be tried on a small surface at a time for fear of inducing irritation.

In most cases a soothing treatment is demanded by means of alkaline, bran-, or other demulcent baths, followed by some of the dusting-powders or the lotions advised for use in the acute stages of eczema. Ointments are not indicated, as a rule, but in a few cases diachylon ointment (Hebra), Lassar paste, zinc, mercurial, and other pastes and ointments have been used to advantage. For relief from itching camphor and chloral (1 to 5 per cent.) in oils or ointments may be employed. Many patients are treated with very great comfort to the end in the continuous warm water-bath.

Prognosis.—The prognosis is always doubtful, and may be at times grave. Temporary recovery from repeated outbreaks is common. Persistence for years with periods of aggravation and decline is the rule. Brilliant recoveries, however, occur under skilful treatment.

DERMATITIS HERPETIFORMIS IN CHILDREN.

Knowles¹ has made a careful study of the records of fifty-seven cases of dermatitis herpetiformis reported by 41 different authors, with results summarized as follows: Predisposing causes are (with an inherited or acquired neurotic tendency and weakened resistance) debility resulting from the exanthemata, sepsis, toxines, visceral disorders, and undue exposure—these seemed operative in about one half of all cases—the most occurring in male subjects. The number of cases diminished in very early years. Prodromata were absent or mild; the lesions most often were vesico-bullous, usually generalized, the face and extremities being most often involved. Curiously at variance with symptoms in the adult was the absence of grouping of lesions, which were rarely pruritic, and were seldom followed by pigmentation. The prognosis was not grave.

HERPES GESTATIONIS.

(PEMPHIGUS HYSTERICUS. *Fr.*, DERMATITE POLYMORPHE DOULEUREUSE RÉCIDIVANTE DE LA GROSSESSE.)

The special form of dermatitis herpetiformis occurring in pregnancy does not differ in its general features from the types of the disease seen in non-pregnant women and in men; but there can be no question that the pregnant condition in many cases bears close relation to the eruptive phenomena. The eruption often accompanied by febrile accesses may develop after the conclusion of pregnancy, but more often from the third to the fourth week after conception. Vesicles, blebs, papules, macules have been observed repeatedly in successive pregnancies of the same woman and in that subject at no other time. The lesions in these cases are exceedingly pruritic; often are developed symmetrically over large areas of the surface, usually more abundantly over the lower limbs; and may be relieved completely before the termination of gestation, or only at that period. In a few instances both death of the fœtus and persistence of the disease after delivery have been reported. The child may be born into the world in a condition of sound health, though the nervous system of the mother commonly is affected profoundly during and often for some time prior to the occurrence of pregnancy.

HYDROA BULLEUX

is a rare pruriginous form of the same disorder which may be accompanied by a febrile movement. The eruption develops with vesicles of medium size, which later increase and multiply, become slightly umbilicated, desiccate, and are covered with crusts of variable size and color according to whether there has or has not been secondary infection as a result of the scratching. The eruptive elements

¹ J. C. D., 1907, xxv., p. 247 (with 48 references to literature).

appear in crops accomplishing cycles of evolution and may be generalized extensively, even invading the palms and soles.

IMPETIGO HERPETIFORMIS.¹

(HERPES PYÆMICUS.)

This is a rare inflammatory affection of the skin occurring for the most part in pregnant women, characterized by the development of smaller and larger pustules in groups and productive of grave systemic disturbance, often terminating fatally. Knowledge of this disease is limited to the reports of less than a score of cases observed by Hebra and Kaposi in the Vienna clinic, and of a few scattered cases reported by others, including, in America, Heitzmann, Fordyce, Whitehouse, and Hartzell. Of the Vienna patients, twelve were women, and the most of these were in the puerperal state. Gunsett gives abstracts of twenty-eight cases: nineteen puerperal women, eight men, one non-pregnant woman.

Symptoms.—Erythematous macules followed by pinhead-sized pustules, usually closely set in groups, filled with an opaque or a yellowish-green fluid, are discovered upon the surface of the groins, the navel, the axillæ, the breasts, the thighs, and other portions of the body. A dirty brownish-colored crust is formed by rupture or desiccation of these lesions, and about this crust single, double, or triple concentric circlelets of new and similar lesions appear in succession, each series undergoing a similar process of involution. The eruption thus extends until the circlelets from different foci of origin unite, and extensive areas of the skin are involved. Beneath the crusts the skin is reddened, infiltrated, smooth, and covered with a new epidermis, moist as in eczema or exhibiting a denuded corium. There is no ulceration. In the course of three or four months the eruption is well-nigh universal, the skin being swollen, shining, and crust-covered, or seamed with excoriations surrounded by circles of pustules. Exceptionally there are multiformity of lesions and the occurrence of the disease in women who are not pregnant. The lingual mucous membrane exhibits grayish, centrally depressed patches, well defined in contour. Alternate rigors and febrile accesses mark the periods of recrudescence when new pustules form. The physical prostration is usually grave. Delivery seems to have no favorable effect upon the course of the disease in pregnant women. An endometritis with peritonitis was discovered post mortem in a single case. Two women only of the thirteen Vienna patients survived;

¹ Literature: Hebra, *Wien. klin. Wochenschrft.*, 1872, 48. Kaposi, *Viert. f. Derm. u. Syph.*, 1887, 275. Dubreuilh, *Annales*, 1892; see also *La Prat. Derm.*, ii., 1901, p. 915. Breier, *Derm. Zeit.*, 1894, i., p. 199. Dauber, *Archiv*, 1894, xxviii., p. 265. Borzeki, *Ibid.*, lxxvii., p. 403; *Annales*, 1906, s. iv., vii., p. 304. Hartzell, *J. C. and G. Ur. Dis.*, 1897, p. 506. Jamieson, *Atlas Int.*, pl. xxviii. Tommassoli, *Archiv*, 1898, xli., p. 197. Zeisler, *Monatshefte*, 1887, vi., p. 950. Fordyce, *J. C. D.*, 1897, xv., p. 495. Sabolotsky, *Monatshefte*, 1895, xxi., p. 645. Kren (*Riehl's Clinic*), *Ibid.*, 1907, xlv., pp. 297, 300.

one suffered from a relapse after several weeks of improvement. Of a total of 34 observations collated by Borgester there were 19 fatal cases.

Etiology and Pathology.—The etiology and pathology of the disease are necessarily obscure, having in view the relatively small number of reported cases. The relation between this rare disorder and herpes gestationis, dermatitis herpetiformis, and miliary and vegetating forms of pemphigus is not determined. Some of the reported instances of the disease are not regarded as strictly assignable to the affection first studied in Vienna. In an interesting contribution to this subject, Kren calls attention to the sharp distinction between the Hebra type of impetigo herpetiformis and the other diseases named above from which it is to be distinguished. In two patients shown by him to the Vienna Dermatological Society, a panaritium seems to have been the starting point of the septic process—in one case, a panaritium formed on the left middle-finger, in another, a pustule on the big toe of the right foot antedated the febrile process.

Dumesnil, Marx, and Dubreuilh have examined the skin removed from living subjects of the disease, and have discovered dilatation of the blood- and lymph-vessels with swollen endothelium and embryonic cells surrounding these, especially in the papillary body at the base of the pustules. Cocci were present in the pustules, which are always within the epidermis, and there was acanthosis of the palisade-layer of prickle cells. Post-mortem evidences of nephritis, endometritis, and pulmonary tuberculosis have been recognized in different cases.

Diagnosis.—The diagnosis of the disease is between herpes, dermatitis herpetiformis, and pemphigus.

In herpes the purely vesicular character of the lesions and the cyclical career of the disease indicate its nature. In dermatitis herpetiformis there is commonly a distinct multiformity of lesions, and the subjects of the disorder are not, in such great preponderance, pregnant women. In pemphigus the size of the bullæ and their distribution in other than concentric groups will indicate the character of the disease. Special care should be taken to distinguish impetigo herpetiformis from pemphigus vegetans. The locality primarily invaded is the same in both diseases. For details consult the paragraphs devoted to the malady last named.

Treatment.—The treatment is conducted on general principles, including the administration of antipyretics, and the local employment of alkaline or of carbolated baths; starch and other dusting-powders; anodyne, carbolated, or simple salves; and coal-tar. The uterus should be relieved of its contents. Some of the recoveries followed treatment by continuous immersion.

Prognosis.—The prognosis is necessarily grave. Nearly one half of those attacked perish.

PEMPHIGUS.¹

(Gr., πᾶμφιξ, a bladder.)

(POMPHOLYX. Ger., BLASENAUSSCHLAG.)

Pemphigus is an acute or chronic affection of the skin, characterized by the formation of one or several well-defined, oval, rounded blebs, elevated or not above the level of the general surface, which may or may not be associated with systemic symptoms, the lesions developing in successive cycles of eruption.

With respect to the question whether pemphigus should be regarded as the name of a distinct disease or of a group of several diseases, various opinions are held. At one time every dermatosis displaying blebs was accounted a form of pemphigus. With increasing knowledge there has been a greater reluctance to distinguish any disease by this specific term alone merely because of the presence of a bullous exanthem, and as a result a number of affections exhibiting bullous efflorescence upon the cutaneous surface have been wholly disassociated from both pemphigus and what the French term the "pemphigoid eruptions." For some authors there is only a chronic pemphigus; for others, in order to establish a diagnosis of pemphigus, the existing lesions should repose directly upon the skin without exhibiting a peripheral inflammatory areola, or at least be the expression of a disease with periodic exacerbations in a determined career.

In many morbid conditions of the skin bullæ are present, when it is manifestly improper to call the disease pemphigus. For example, these lesions are exhibited typically in some forms of lepra, in inherited syphilis, often as a result of the traumatism of insects and of several infective processes. To assert that a disease is a pemphigus in one of its varieties, it is necessary to recognize the presence of other symptoms than bullæ.

Symptoms.—The distinctions respecting the bullous dermatoses established by Brocq are worthy of recognition. In a first class are included, as suggested above, the bullæ which are epiphenomena of some malady (*e. g.*, erysipelas). In a second class the bullæ are either the main feature or one of the main features of a disease. The second class includes both the dermatoses in which the eruptive symptoms are not commonly of bullous type, but which become such under special conditions (*e. g.*, polymorphous erythema bullosum), and those eruptions to which the term *pemphigus* is assigned by the best authors.

It is to this second class, and to the last-named subdivision of the class, that the title is assigned in the paragraphs which follow. In this group are included: (a) Acute pemphigus; (b) Pemphigus of

¹ Bibliography: Duhring, Cutaneous Medicine, pt. ii., pp. 449-468 (Phila., 1897). Brocq, La Pratique Dermatologique, t. iii., pp. 723-838 (complete bibliography). Spiegler, Mraček's Handbuch, Bd. ii., p. 1 (bibliography). Grouven, Archiv, 1901, lv., pp. 85, 247, 419 (3 plates and bibliography). Krzyżtalowicz, Monatshefte, 1903, xxxvi., p. 165. Unna, Archiv, 1903, lxi., p. 248 (abstract).

the newborn; (c) Chronic pemphigus; (d) *Pemphigus foliaceus*; (e) *Pemphigus* of young girls; (f) *Pemphigus vegetans*, of Neumann.

It will appear later that at least two of the symptom-groups named above will eventually be included in a different category.

It should be understood further that these are simply clinical distinctions of value for the time being. There are doubtless other forms of pemphigus; and there are unquestionably morbid conditions here described which may be classed later more appropriately with other affections.

Etiology.—The causes of pemphigus are obscure; yet the connection of many varieties of the disease with changes in the trophic nerves and nervous centres is established by sufficient proofs. In the case of a young woman under our charge who succumbed to pemphigus vegetans, the remote cause of the disorder was the nervous shock consequent upon rape. It is well known also that traumatisms and lesions of the cord have been followed by bullous efflorescence upon the body-surface. At the same time (as Kaposi has well shown), on the one hand, blebs from these demonstrable causes never resemble the portraits distinguishable in the varieties of pemphigus; and, on the other hand, there is no uniformity among lesions, either as to anatomical site or other features, in the spinal changes to be recognized in pemphigus with a fatal issue. Further, of nine autopsies of bodies dead of pemphigus examined by Kaposi and Weiss, in only one were changes found in the cord (diffuse sclerosis). Zahn¹ has observed eleven cases where a pemphigoid rash followed progressive paralysis.

The view that these dermatoses are instances of infective trouble (auto-intoxication) is, therefore, gaining ground, and it is quite probable that future investigation will demonstrate that both the cutaneous and the nerve lesions are the results of a toxic agency operating with morbid results upon each.

Pemphigus is reported as of more frequent occurrence in males, but there is doubt as to the fact. The disease is certainly more common in infancy and childhood, because the powers of resistance at a tender age are inferior to those of a maturer epoch. Pemphigus often is observed in debilitated patients who are suffering from "nervous prostration," "mental worry and exhaustion," "neurasthenia," "general debility," visceral disorders, and impairment of nutrition.² In vigorous, rosy-cheeked, strong-limbed adults the disease is rare. It is not inherited. The states in which there is marked impairment of bodily vigor are particularly favorable to the development of the disease. It occurs in hysteria and other neurotic affections, but the etiological relations which these bear to the malady are undetermined. We have observed one case of the disease in an adult in whom pemphigus of typical appearance occurred after mental depression, which

¹ Allg. Zeit. f. Psych., 1907, Heft 4.

² Vollmer, E., Zeitschrift, 1901, viii., p. 138; White, C. J., Boston Med. and Surg. Jour., 1903, cxlix., p. 297.

was so greatly increased by the appearance of the exanthem as to lead to suicide.

In some cases, notably in pemphigus foliaceus, it is known that chills and fever have preceded the outbreak. A few cases of pemphigus vegetans have followed mild trauma-whitlow of the digits consequent upon wounding the tissue with splinters. Acute pemphigus has followed sepsis, vaccination, rheumatic and other fevers, diphtheria, the exanthemata, and even long confinement in ill-ventilated apartments.

There is good reason to believe that in some of its forms the disease is contagious. The bullous lesions, however, seen in syphilis, lepra, and other similar disorders should not be included here.

The contents of the bullæ of acute pemphigus were found by Gibier, in 1882, to contain bacteria. His observations were confirmed by Vidal and Roeser. Demmé¹ found cocci both in the contents of the bullæ and in the blood. Whiphouse² found diplococci resembling those described by Demmé; and by means of culture and inoculation-experiments has furnished strong presumptive evidence in favor of the bacterial origin of the disease. Krzyształowicz³ has recognized a streptogenous source in several unclassified forms of bullous dermatitis. Pernet and Bullock⁴ have recorded a number of fatal cases which occurred in butchers, the origin of which was traced to a local wound-infection. Other observers have searched in vain for a specific micro-organism of pemphigus either in the bullæ or in the blood.

Pathology.—Anatomical changes in the spinal cord have been recognized in pemphigus, as explained above, but in many cases careful search has failed to discover such changes. Déjérine and Leloir found in a case of pemphigus changes in the peripheral nerves due to degeneration.

Both in the bullæ and in the blood there may be a marked increase (even to 18 per cent.) in the number of the eosinophilous cells, though the reverse may be true. In this respect pemphigus corresponds closely to dermatitis herpetiformis. The increase of the eosinophilous cells in both affections has been assigned to the effect of an irritant upon the nerve-centres. Coe⁵ calls attention to the fact that in some rapidly fatal cases of pemphigus the eosinophilic leukocytes may be reduced to six per cent. of the normal number; and cites the case reported by Russ, in which the disease was fatal in a fortnight and there was entire absence of eosinophilia. Grinew⁶ found the number of red blood corpuscles diminished; the white corpuscles slightly increased; and the volume of the erythrocytes

¹ Vierteljahr., 1886, p. 636.

² London Lancet, May 2, 1896.

³ Loc. cit.

⁴ B. J. D., 1896, viii., pp. 157 and 205 (with references to literature on acute pemphigus).

⁵ Amer. Med., 1902, June 28, p. 1093.

⁶ Russische Zeitschr. f. Haut- und vener. Krankheiten, 1904, Bd. viii.

smaller, the blood as a result being more fluid. The hemoglobin content is markedly reduced; the number of lymphocytes is diminished; the number of mononuclears and polynuclears slightly increased. The neutrophile leukocytes are increased; the eosinophiles diminished; the basophiles absent.

Most of the bullæ are situated superficially between the rete and the horny layer or in the upper part of the rete. Nikolsky¹ believes a feeble coherence between the stratum corneum and the stratum lucidum to be characteristic of the disease though the value of the Nikolsky symptom is denied by Traufi.² Dubreuilh calls attention to the intimate relationship between pemphigus and epidermolysis established by the facility of separation of the individual layers of the epidermis, congenitally bequeathed in the one case and acquired in the other. The bullæ may be the result of an inflammation in the corium, but more probably are due to a mechanical separation of the rete-cells by a sudden effusion of fluid from the vessels of the derma, the papillæ becoming at the same time markedly œdematous. In the final stage of chronic pemphigus, extensive and deep infiltration of the vessels, and peri-vascular infiltration involve the cutis. The lymph-vessels and lymph-spaces are dilated chiefly at the margin between the cutis proper and the papillary body. The ridge-net is hypertrophic, containing mitoses, a normal granular layer, and a horny layer varying in thickness. In pemphigus foliaceus the ridge-net is flattened, and the suprapapillary layer is reduced to a minimum, so that the altered corneous layer stretches almost immediately above the heads of the œdematous papillæ. In general the œdematous epithelium is softened, and the prickle-borders and the interspinous spaces disappear. The epithelial cells of the coil-glands are swollen; those of the ducts to a less extent. In time the epithelial linings of the hair-follicles disappear with the hairs. The entire process points to a persistent vascular paralysis, with dilatation especially of the subpapillary lymph-vessels, and an œdematous swelling of the constituents of the skin, denser in the connective tissue, and accompanied by softening of the epithelium. The hairs and sebaceous glands play a purely passive part. Clegg and Wherry³ found in five cases of pemphigus neonatorum and one case of pemphigus contagiosus of the tropics micrococci similar to those described by Almqvist.⁴ The authors advise that the name pemphigus contagiosus be employed whether the disease affect children or adults and that the organism be described as *micrococcus pemphigi contagiosi*.

In pemphigus vegetans, cultures from the fluid contained in the blebs are either negative or indicate the presence of staphylococcus aureus. Hamburger and Rubel found micrococcus lanceolatus in the lungs and a pseudo-diphtheria-bacillus in the blood of their patient. In most autopsies of victims of the disease no visceral changes have

¹ Nikolsky, Wratscheb. Gaz., 1902 (abstr. in Archiv, 1903, lxiv., p. 452).

² Giorn. Ital. d. Malat. Ven. e. d. Pal., 1905, Heft 5.

³ Journ. Infect. Dis., 1906, iii., p. 165.

⁴ Ztschr. f. Hyg., 1891, x., p. 253.

been found; but in the case reported by Mr. Hutchinson a lymphosarcomatous tumor was recognized near the spine, and in it were embedded the pancreas and large vessels. Hamburger and Rubel recognized a similar tumor originating in the thymus and lying in the anterior mediastinum.

Weidenfeld,¹ in an exhaustive study of the histology of the disease, calls attention to the enormous dilatation of the blood- and lymph-vessels always present, together with the cellular infiltration of their walls, the œdema of the papillary layer of the cutis, the changes in the elastic tissue fibres, which may be wanting in cases, and the œdematous condition of the rete. He believes the dilatation of the vessels to be idiopathic and unconnected with epithelial changes. Fabry² points out that in pemphigus foliaceus, the important morbid symptom is not bleb-formation, but the granulomatous condition of the cutis with secondary parakeratosis and secondary changes in the vascular and secreting systems of the skin. Pellagatti³ in describing lesions recognized post mortem, in a case of pemphigus, found 75 per cent. of large mononuclear cells in the bone-marrow of the femur with an homogeneous protoplasm and a nucleus poor in chromatin; there were 12 per cent. of eosinophilous cells; 7 per cent. of small lymphocytes and the remaining 6 per cent. mononuclear. The changes were conspicuous at the periphery of the medulla and gradually diminished toward the centre.

Diagnosis.—From what has preceded, it will be inferred that pemphigus is a name given to a disease, and not merely to bullous lesions upon the surface of the skin. It is of importance to remember this fact, as several authors have used the term in a purely descriptive sense, the truth being that bullæ are manifestations of several disorders, including syphilis, lepra, herpes iris, and erythema multiforme.

At the outset the blebs of pemphigus can scarcely be differentiated from those of other diseases. It is necessary for the recognition of the malady that consideration be had of all the cutaneous and other phenomena present.

In the bullæ of lepra there is usually coexisting cutaneous anæsthesia, and the involution of the bleb is followed by a strikingly characteristic atrophic patch, usually pigmented and insensitive. In pemphigus foliaceus the extraordinary and usually generalized desquamation which ensues is sufficiently distinctive, though it must be borne in mind that several varieties of pemphigus may be transformed, the one into the other, by well-nigh insensible gradations. Among its graver forms susceptible of such transformation may be named impetigo herpetiformis, pemphigus cacheecticus, pemphigus diphtheriticus, and pemphigus pruriginosus.

In herpes iris the lesions are more vesicular than bullous and

¹ Archiv, 1903, lxvii., p. 409.

² Archiv, 1904, lxxx., p. 183.

³ Giorn. Ital. d. Mal. Ven. e. d. Pelle, 1905, Fasc. 1.

much more transitory; are concentrically arranged and vary in color; and are situated more frequently upon the extremities, especially the backs of the hands. The bullous lesions occasionally seen in urticaria and erythema multiforme are to be recognized by the other characteristic symptoms of those diseases; in the former, more particularly, by their intermingling with typical wheals, and in the latter by the location of the eruption and its climatic or seasonal significance. Some of the reported contagious forms of pemphigus, epidemics of which have been described by Besnier, Hervieux, and other French authors, were possibly, as Dühring suggests, instances of impetigo contagiosa. This inference is sustained by the frequent allusion of the writers named to the "varicellaform" appearance of the lesions. The lesions of true pemphigus are neither contagious nor auto-inoculable.

In syphilis blebs are rare in the adult, and relatively more frequent in infants hereditarily diseased. In infants the blebs usually are seen at birth, often upon the palms and soles, are often pus-filled, and frequently are superimposed upon an exulcerated base. The co-existence of mucous patches of the mouth, the vulva, and the anus with the other characteristic lesions and signs of grave cachexia, will indicate usually the nature of the disease. The cutaneous symptoms of infants thus affected are designated improperly as pemphigus. Such an eruption is a bullous syphiloderm.

In a large proportion of cases pemphigus vegetans has been mistaken for syphilis, the close grouping of the lesions about the anogenital region, and their striking resemblance to condylomata, taken in connection with the presence of erosions of the mucous membrane of the mouth, being the grounds for error. In pemphigus vegetans the vegetations are more superficial than in syphilis, are of more rapid evolution, and exhibit fringes of blebs at the border of any suspected lesion, while the genital condyloma has a smooth border without traces of a bullous efflorescence. Further, the surface is "stippled" (Neumann), and never smooth as in condyloma, and the mouth-lesions are far more painful.

However closely packed together may be condylomata of this region, they rarely spread, as does pemphigus vegetans, beyond the regions adjacent to the mucous outlets; while the bullæ of pemphigus vegetans, when the disease is fairly advanced, are not only exceedingly numerous and closely packed together, but they spread also beyond—high toward the pubes and low over the inner faces of the thighs. There is commonly a history of fever, no lymphatic adenopathy, and a distinct uniformity of lesions, each separate element being of bullous type. Dermatitis herpetiformis and some forms of pemphigus are "closely related," as Dühring suggests. The grouping, subjective symptoms, and even the lesions of the disorders are often alike. It is probable that their exact relationship may be determined eventually.

Some ingested medicaments are capable of producing bullous

lesions, for example, potassium iodide; such a possibility should always be borne in mind when establishing a differential diagnosis. Scabies in infants and older children is occasionally characterized by the formation of blebs, in which case the other lesions present, as also a history of contagion and the discovery of the parasite, will point to the real nature of the disease.

Lastly, the external application of cantharides, mezereon, the stronger acids, alkalis, and other chemicals may be followed by blebs produced either by accident or by intention with a view to feigning disease. The intentional production of such symptoms is usually effected upon the anterior faces of the lower extremities, regions within easy reach of the right hand. Erysipelas and dermatitis calorica are also affections in which blebs appear, always, however, of minor significance as compared with the other symptoms of disease present. The same may be said of the bullæ which form upon a gangrenous integument.

Treatment.—The internal treatment of pemphigus is a matter of importance, as will be suggested by even a brief consideration of the constitutional states in which it occurs. Hutchinson¹ believed that “arsenic is a specific for the state of health upon which relapsing pemphigus depends.” This remedy should be employed, if at all, with caution and in accordance with the rules prescribed in the section on Psoriasis. Kaposi declared that he had been unable to obtain favorable results from its employment. Iron, quinine, ergot, strychnine, and the mineral acids are indicated in many cases, in conjunction with a nutritious diet. Cod-liver oil and the malt preparations on the market should not be neglected. Salicin (Crocker), 15 grains (1.0) three times daily in water, has been useful. Not infrequently the treatment should be directed to the relief of the anomalous disturbances of the sexual function in women, as pemphigus has been found to occur in the hysterical and chlorotic states common as a result of functional disorder. Cassâet and Micheleau² report curative results in the treatment of pemphigus by exclusion of salt from the dietary.

The local treatment of the lesions should consist, first, in puncturing each bleb with a fine needle, in order to give exit to its contents, which should carefully be removed from the skin with the aid of cotton-wool. Then the parts are to be wholly enveloped in an antiseptic wet dressing, or freely dusted with a powder, such as boric acid, zinc stearate, or borated talcum. When there is considerable pyrexia, with heat and distress in the skin, the affected surface may be treated as an acute eczema, with oleated lime-water, containing opium and carbolic or dilute hydrocyanic acid in some such proportions as those already detailed. Weak sulphur ointments and salicylated pastes may often be used with advantage.

The ordinary lead-and-opium wash, with or without the addition

¹ Lectures on Clinical Surgery, London, J. and A. Churchill, 1878, p. 49.

² Archiv gén. de Méd., 1906, Jan. 16.

of zinc-oxide, may also answer a good purpose. The continuous hot water bath still enjoys among experts the highest favor in the treatment of the grave forms of pemphigus. Kaposi kept a patient day and night for eight months with his body thus immersed, to the great advantage of the invalid. This continuous bath is often impracticable outside a large hospital; but in cases of grave pemphigus the continuous hot water bath has been employed in private practice with the happiest results.

In pemphigus vegetans internal treatment should be directed, usually along the line of elimination and support; locally, the continuous bath affords speediest relief. If this cannot be obtained, the lesions should be cleansed thoroughly and dressed with antiseptic lotions or ointments, or dusted with borated, salicylated, or camphorated powders. The numerous scalp-lesions require cutting short the hairs of the head in order to make applications. Alcoholic stimulants are in most cases essential.

Prognosis.—The prognosis in mild cases of pemphigus, though much less grave than in the malignant forms of the disease, should always be formulated with caution. Unlike several of the diseases heretofore considered, the affection is one not frequently encountered in persons of fair general health. The constitutional condition of the patient must carefully be considered; the disease is not only one liable to relapses, but also is one in which the graver may succeed the more benign manifestations. A flaccid summit of the bleb, sanguinolent or ichorous contents, an abundant efflorescence, and a rapid succession of new, after the involution of more ancient, lesions, are in general unfavorable symptoms. The same may be said of degeneration of the floor of the bleb after rupture and discharge of its contents. Persons of advanced years, the cachectic, the asthenic, and women overtaxed in childbearing, rarely are relieved when attacked by graver forms of the disease. Albuminuria, pneumonia, diarrhœa, and the inability to insure nutrition of the body when the mouth is sore, are all unfavorable complications of the disease.

PEMPHIGUS ACUTUS.

(FEBRIS BULLOSA, PEMPHIGUS FEBRILIS.)

In this rare form of the disorder the course of the morbid process is relatively rapid in the direction often of a grave termination or toward recovery, a few days or weeks sufficing for the cycle of manifestations. We have had under observation four adults exhibiting classical symptoms of the disorder, one young woman dying in a week after the onset of the attack. The subjects, however, are usually children.

There is usually a premonitory malaise with chills and fever, followed by the rapid efflorescence of split-pea- to small-egg-sized blebs symmetrically and at times very generally displayed over the body-

surface. There is about many of the lesions a distinct halo. The mucous membranes, more particularly the mouth, may be involved slightly or extensively or be spared wholly. The eruption when developed is accompanied by a febrile process; the systemic signs of grave prostration are commonly present; the eruptive phenomena may be developed in cycles or in single rapid explosion; and the contents of the blebs may be pellucid, cloudy, purulent, hemorrhagic, or even gangrenous. In fatal cases there are coalescence of blebs, a purulent and bloody character of their contents, and the denudation of large areas of the skin whence have been removed the outer layers of the epidermis. In cases about to terminate fatally there are also usually a precedent flaccidity of the bullous envelopes, and the symptoms of grave toxæmia (stupor, albuminuria, anuria, etc.).

FIG. 68.



Acute pemphigus. (F. V. Johnson.)

Pernet¹ collated seventeen cases, the history of many of which seems to point to an origin from infection with septic animal poison (cases

¹ Pernet and Bulloch, B. J. D., viii., 1896, p. 157,

occurring after bites of animals, in butchers, etc.). In the cases examined, a diplococcus was recognized by Demme which is supposed to have been the etiological factor present.

Bowen¹ reports a case of acute infectious pemphigus occurring in a butcher during an epizootic of foot and mouth disease. He reviews the entire literature of the subject. Köhler² reports an epidemic of acute pemphigus involving seven persons, three adults. Caie³ describes a fatal case occurring in a farm laborer who had been handling cattle.

If it be demonstrated eventually that the disease invariably has its origin in the infection of a trauma with septic material of animal origin, the affection should be assigned to another category than pemphigus. Children may thus be infected as well as adults, but in the former event the results are not to be confused with those recognized in *Pemphigus neonatorum contagiosus*, described below.

PEMPHIGUS NEONATORUM.

(PEMPHIGUS CONTAGIOSUS NEONATORUM ACUTUS; PEMPHIGUS EPIDEMICUS; PEMPHIGUS CONTAGIOSUS.)

This is a disorder obviously contagious, occurring usually in epidemic form, and affecting newborn infants.

The first symptoms noted are punctate and larger reddish macules resembling a flea-bite. These enlarge and a thin pellicle forms over the spot, from which later vesicles develop as large as hazelnuts. The lesions often burst before reaching maturity, the areola meantime spreading over a space with a diameter of several centimetres. After bursting, the areas of involvement spread with centrifugal denudation of the epidermis. The fluid furnished by the lesions is scanty or abundant, golden-yellow or, especially in cases that prove fatal, grayish-tinted. The regions affected are the abdomen, groins, axillæ, nates, neck, genitals, inner aspect of the thighs, the flexures of the elbows and knees, and, to a certain extent, the face. As the disease often proves fatal, the symptoms of systemic disturbance in such cases are well marked, including inappetence, abdominal distention, vomiting, œdema of the lungs, cyanosis, and dyspnea.

The disease occurs also in milder type, in which the lesions are relatively few, the areolæ about the vesico-bullæ fade, yellowish crusts represent the desiccation of the blebs, the contents of which become gradually scanty.

Maguire,⁴ Adamson,⁵ Holt,⁶ and others have made interesting contributions to the subject. The proof of the transmission of the disease to children from midwives, nurses, and attendants by the

¹ J. C. D., 1904, xxii., p. 253 (2 illustrations).

² Deutsch. Archiv klin. Med., 1899, lxii., p. 5.

³ Brit. Med. Jour., 1903, p. 308.

⁴ B. J. D., 1903, xv., p. 427.

⁵ Ibid., 1903, xv., p. 447.

⁶ N. Y. Med. Journ., 1898, Feb. 5.

medium of the hands, the clothing, etc., is incontestable. In Ostermayer's case¹ the mouth of a child affected with pemphigus neonatorum seems to have infected the nipple of the mother, the infant dying from malnutrition as a consequence of the oral lesions. Maguire shows that in every fatal case the stump of the umbilical cord had been infected. The disease is without question due to transference of pus-cocci (*Staphylococcus pyogenes aureus*?) from one individual to another. It is now generally admitted that the affection is really an infantile form of Fox's impetigo contagiosa. Adamson, however, calls attention to the warning of Sabouraud, that the staphylococcus is invariably present as the result of a secondary infection, and that by the use of a fluid medium securing anaërobic conditions the streptococcus may be recognized.

Hedinger² calls attention to the close resemblance between dermatitis exfoliativa neonatorum and pemphigus acutus neonatorum. In epidemic development, it cannot be doubted that the two conditions designated by these names appear to be from both the clinical and pathological points of view identical.

It follows from what precedes that pemphigus neonatorum also may properly be removed from the category of affections strictly catalogued as pemphigoid.

CHRONIC PEMPHIGUS.

(PEMPHIGUS VULGARIS.)

The term Pemphigus Chronicus is applied to the more common clinical forms of the malady, and it has been employed generically by many authors to include all varieties of the disease. The title *Pemphigus Diutinus* has been used also to designate that pemphigoid eruption in which the characteristic lesions follow each other with rapidity and in profusion, fresh bullæ appearing each day. Fortunately, all forms of the disease are relatively rare.

The cutaneous lesions in chronic pemphigus are usually preceded by febrile symptoms; and the disturbance of the economy is declared in cardiac, respiratory, and gastro-intestinal derangements of function. The fever may be continuous, remittent, or intermittent, and is usually aggravated just before the appearance of a fresh crop of blebs.

The face, the trunk, and the extremities are chiefly involved. The eruption first appears bilaterally, somewhat symmetrically or asymmetrically, in reddish macules of rather vivid hue, in the centre of each of which appears later a whitish elevation of the epidermis suggesting a wheal. Either upon these or upon unaffected points of the skin there subsequently form tense, well-rounded or oval vesicles developing into bullæ varying in size from that of a pea to that of a hen's egg and even larger, and in number from three to six only, to

¹ Archiv, 1903, lxvii., p. 109.

² Archiv, 1906, lxxx., p. 349.

PLATE XI



Chronic Pemphigus.



a hundred and more; they are usually irregularly distributed (*Pemphigus Disseminatus*), but they may be clustered in groups, or very rarely be found the younger encircling the older lesions, so as to form a circinate patch (*Pemphigus Circinatus*); their contents are serous or bloody (*Pemphigus Hæmorrhagicus*), or, later, purulent, the color corresponding with that of pus. The bullæ often coalesce, and, whether ruptured or not, the involution of the lesion is accomplished by desiccation and crusting, the crusts being usually found to contain blood, pus, epithelial débris, and the exudate from the base of the bleb. Beneath such a crust there forms a new epidermis, which is usually violet, purplish, or bluish red in color, and which later displays a brownish pigmentation which may survive the disease for several weeks. The evolution and involution of a single lesion may be accomplished within a few days, but the survival of the disease in successive eruptions may extend through weeks or months.

Fox¹ describes a case of pemphigus which, in the case of a woman, lasted for nine years and eventually presented the clinical features of pemphigus congenitalis (epidermolysis).

Occasionally the affection occurs with very mild and even insignificant phenomena (*Pemphigus Benignus*). There may be no fever, and very few blebs appear; in some cases but a single lesion can be seen (*Pemphigus Solitarius*). In other instances the fever is intense; the eruption abundant; the skin œdematous, painful, pruritic, excoriated; and the underlying lymphatic glands are enlarged. This general condition with exacerbations and remissions may persist for months, and the eruption may then disappear never to return, or to recur, as it often does, in the future.

Clinically, many of the distinctions between the varieties of pemphigus disappear. Between the benign processes just considered and the grave form of pemphigus foliaceus described below several intermediate gradations can be observed, and even the most benign may at times unexpectedly assume the most malignant phases. *Pemphigus Malignus* is a name given generally to those intermediate varieties of the disease, most of which are distinguished by persistent and prostrating fevers; by cachexia, especially in infants; by the occurrence of diphtheritic patches upon or about the lesions, with infiltration of the derma and slough of its superficial layers; or by extensive crusting, and even subsequent ulceration.

In all varieties of pemphigus the lesions may be exhibited upon the mucous membrane of the accessible outlets of the body.

Chronic pemphigus exhibits the greatest variation both as to its symptoms and as to the period of their efflorescence. There may be a week or a month of immunity, followed by benign relapses or by malignant and rapid recurrences. Chills, fever, gastro-intestinal disturbances, and even profound depression may precede one or each of a series of eruptive phenomena. The bullæ may form upon an unaltered or a deeply hyperæmic skin, in all sizes from that of a pea to that

¹ B. J. D., 1907, xix., p. 318.

of an orange, invading the skin and mucous surfaces including the vagina, the lesions at the base exhibiting the several features described above. The eruption is rarely generalized, and throughout the course of the disease not more than half a dozen lesions may at any moment be visible upon the surface of the skin. Their contents may be removed by evaporation, absorption, or rupture, leaving a crust the color of which is largely determined by the contents of the bleb.

The areola, which may or may not be present in the several forms here described, is commonly narrow, and is fully developed only when the bleb is mature. The separate lesions may persist for days, or may rupture at an earlier period, leaving behind a superficial excoriation which after healing exhibits pigment.

The intercurrent disorders in the several forms of the disease designated may be numerous, death occurring from septicæmia, exhaustion (especially when a deep slough results, as in pemphigus gangrænösus), and lymphangitis, the neighboring vessels and glands exhibiting evidence of the toxic effects produced by the cocci present. In some cases the general symptoms are absent or are insignificant, and the subjective sensations are limited to a slight feeling of burning or of tension. In other cases the blebs project from the affected surface and are well distended; in still others they are flaccid, the roof partially collapsing upon the serous, purulent, or bloody contents. The crusts which form are rarely bulky; they are more commonly dark colored and thin.

Pemphigus Pruriginosus is a name applied to that grave form of the disease in which the lesions give rise to an intense pruritus. As a result of the scratching induced by the pruritus they are torn, excoriated, and commingled with the crusts and exudations of an artificially engendered dermatitis. If the itching be severe, the vesicobullæ may be so torn as to be difficult of recognition. Several of the malignant and intermediate forms may terminate fatally.

PEMPHIGUS FOLIACEUS.

(BULLOUS DERMATITIS.)

Pemphigus foliaceus is a rare variety which may originate in one of the common dermatoses or in a grave form of pemphigus chronicus, or may, at the onset, present characteristic features. Hallopeau and Fournier have reported cases which began as a dermatitis herpetiformis. The lesions are flaccid bullæ, which are developed without a perceptible preëxisting exanthem, and which speedily rupture and discharge their ill-conditioned contents, leaving beneath an excoriated, reddish or purplish, and at times inflammatory surface. Often the blebs are defined so poorly that the epidermis seems scarcely raised from the tissue beneath, the condition resembling that of the skin to which a blister has been applied, with the result of imperfect vesication. The contents, at first pellucid or lactescent, become later puru-

lent or sanguinolent. When rupture of the blebs occurs, there form yellowish-brown crusts which acquire a feeble attachment to the centre of the floor of the original chamber, while the edges remain free; these edges, visible over the affected surface, in polycyclical or irregular outlines, incompletely hiding the raw and sodden epidermis, present a characteristic picture.

The disease spreads gradually until it becomes symmetrical and universal, a peculiarity which marks it as unique among the pemphigoid eruptions, and which, in a striking degree, distinguishes it from pemphigus vegetans and from pemphigus acutus. As the disease advances the patient lies in a pitifully helpless condition, the remaining epidermis being completely undermined by the serum exuded, in places exposing large denuded areas of skin in a condition of inflammation of a low grade. Even, however, when the disease is fully generalized the appetite and bowel-function are at times unimpaired. In its later stages, after it has become generalized, the pemphigoid origin of the disease is not always easy of demonstration. In these instances large masses of greasy scales are exfoliated from the surface, the moisture proceeding from which is scarcely sufficient to attract attention. The odor from the body becomes offensive; fissures form in the infiltrated skin; the facies of the patient may become as repulsive as in some forms of lupus or variola; the swollen hands with distorted nails and contracted fingers resemble claws.

The disease affects the mouth and throat, denuding the mucous surfaces of the epithelium. The scalp becomes affected, as also the covered portion of the body. The hairs remain attached for a long time, but eventually they are completely swept away. Over the face, at first merely reddened and scaling, occur retractive processes which at times produce ectropion and consequent conjunctivitis. Over the body, especially at points pressed upon when reclining, profound ulcerations may destroy the deep skin. The palms and soles are infiltrated and fissured rather than the seat of much exudation. The nails are commonly furrowed and distorted; occasionally they are shed. The subjective sensations are those of burning, smarting, and soreness, rather than of itching. If the patient be kept in the continuous water bath, though the disease be not thereby ended, the comfort of the sufferer is admirably secured.

There may be no fever, or there may be a rise of body-temperature with recurrence of lesions which, in a late stage of the disease, appear in the sites of those which have been very imperfectly followed by attempts at repair, a thin and glazed epidermis forming, in cases of chronic type, in the sites of former bullæ. In other cases the temperature remains above normal for weeks at a time, especially in advanced stages of the disease. The malady may complete its course in a few months or may persist for years and though not necessarily, yet is unquestionably fatal in the majority of cases. Death usually results from exhaustion; occasionally an intercurrent pneumonia or diarrhœa concludes the history. Pemphigus foliaceus commonly at-

tacks adults, but Brand¹ reports the occurrence of the disease in a newborn child.

The Inherited Form of Pemphigus is described by Goldscheider, Legg, and others, and is most often noticed in summer, spring, or autumn, rarely in winter. The malady is considered under the title of epidermolysis bullosa hæreditaria.

Pemphigus of Young Girls (*Pemphigus Virginum*, *Pemphigus Chloroticus*).—This disorder, described by Hardy² and Tommasoli,³ is characterized by the appearance upon the skin, of oval or rounded spots of a reddish or rosy hue; upon these spots develop later vesico-bullæ of different sizes which speedily burst and are followed by the formation of thin crusts. It has been suspected that some of these are instances of feigned eruption (*q. v.*). The subjects of the disease are between the fourteenth and the twentieth year of life, unmarried, and usually menstruating irregularly. Others have described a "pemphigus hystericus," to be recognized in hysterical persons of the same class, alternating or corresponding with hysterical attacks, the eruption not uniformly disposed over the surface, and being transitory in duration, disappearing with relative rapidity and leaving no cicatricial traces of its existence. Unna dismisses this affection from the category of true pemphigus.

PEMPHIGUS VEGETANS.⁴

(ERYTHEMA BULLOSUM VEGETANS, HERPES VEGETANS, CONDYLOMATOSIS, PEMPHIGOIDES MALIGNA.)

Neumann⁵ in 1886 was first to describe and furnish illustrations in color of a disease to which he gave this name, and which has since been studied by a number of observers. Crocker, of London, published an excellent monograph giving tabulated results in some eighteen cases; and I published a report of the first case recorded as such in the United States.

The onset of the disease may be marked by languor, malaise, febrile symptoms of moderate severity, and ill-defined symptoms of

¹ Brit. Med. Jour., June 7, 1902.

² Traité prat. et descript. des Mal. de la Peau, Paris, 1886, p. 268.

³ Jour. Mal. cutan., 1895, vi., p. 449.

⁴ Literature of Importance: Neumann, Archiv, 1886, xiii., p. 157; J. C. D., 1889, p. 387. Kohn (Kaposi), Archiv, 1869, vol. 1. Radcliffe-Crocker, Dis. of Skin, and Brit. Med. Jour., No. 16, 1889, p. 590; Med. Chir. Trans., 1889, vol. lxi., reprint, London, 1890. Jamieson and Welsh, B. J. D., 1902, xiv., p. 287 (report of case with autopsy and histology). Hamburger and Rubel, Johns Hopkins Bull., 1903, xiv., p. 63 (with report of case, autopsy, histology, and review of cases to date). Ormsby and Bassoe, J. C. D., 1905, xxiii., p. 294 (acute malignant pemphigus with autopsy). Fischkin, Chicago Med. Rec., 1901 (report of infantile case resembling symptoms in adult). Winfield, J. C. D., 1907, xxv., p. 17 and p. 71 (review of all cases reported to date, report of author's case, 3 illustrations, and bib.). Ravogli, Trans. Amer. Derm. Assn., 1905, Dec. 28-30th. Zumbusch, Archiv, 1905, lxxiii., 121. Brocq, L., La Pratique Dermatologique, t. iii., p. 787; Constantine, E., Annales de Derm. et de Syph., 1907, p. 641. Ferrand, M., ibid., 1907, p. 254.

⁵ Vierteljahr, 1886, Band xiii.

impaired health, after which the morbid phenomena may be declared in the mouth or the skin. In the former region white patches, which are ill-developed blebs that may exhale an unpleasant odor, are visible upon the mucous surface. The detached membrane forming each spot, finally is loosened and leaves behind equal-sized excoriated patches, which produce extreme soreness of the mouth, and which as some heal are succeeded by others. In severe cases they render mastication and deglutition exquisitely painful; and in patients in whom this becomes a prominent feature of the case the nutrition of the body as a consequence is impaired seriously.

The skin-lesions may precede or may follow those in the mouth. They commonly are seen first in women about the vulva, spreading over the ano-genital region and umbilicus as closely set bullæ covered with a mucoid whitish secretion, the features thus strongly resembling the appearance of condylomata of the same region. In connection with the mouth-lesions, the suggestion that syphilis is present is very striking, and has led to this error of diagnosis in a large number of instances reported by those not expert in diagnosis. In other cases the scalp, hands, feet, axillæ, and other parts are involved primarily. The bullous or vesico-bullous efflorescences, which at first resemble those of other forms of pemphigus, speedily exhibit at the site of their production, excavations, ulcerations, or more commonly vegetating masses, the change from the bleb to a fungoid papillomatous growth being scarcely appreciable. The lesions may coalesce and tend to become grouped about the axillæ, the circle at the root of the neck, the bend of the elbows, the hands, the feet, and the scalp, but they have no tendency to become universal, even when extensive. The nails may become affected as a result of the formation of blebs in the matrix. A singular change in the skin, where typical, well-formed bullæ have developed and healed, is a deep pigmentation in puncta resembling comedones, with pin-point-sized verrucoid elevations of the surface. In some regions the sequence of the closely packed blebs, followed by vegetating masses, resembles that seen in pemphigus foliaceus, in which, especially over the back after long decubitus, there form large, granulating erosions, exquisitely painful, and conducive to a rapidly fatal issue. Indelible scarring may result. In the cases reported by Zumbusch, nut-sized and larger tumors developed from the papillary excrescences. The disease progresses in unmistakable accessions of aggravation and improvement, lasting for months and occasionally for years. It is in the large majority of cases eventually fatal. Variations occur, chiefly in the degree of febrile temperature, probably always reactive; in the severity of the buccal lesions; and in the extent of the eruption. The duration may be from a few weeks to two years.

The disease occurs more often in women than in men, usually between the thirty-fifth and fortieth years of life, as a rule first attacking the throat, mouth, and nose.

A survey of all reported cases emphasizes the view taken by Dubreuilh, Tommasoli, and Winfield, that the cases described by authors represent two rather widely different types. In the true pemphigus vegetans of Neumann, which is probably invariably fatal, lesions of grave significance develop beneath the first formed blebs; a second group includes the cases in which a few recoveries have been reported, where the bullæ of chronic pemphigus have been complicated by vegetations springing from the seat of the bullous lesions. True pemphigus vegetans, though without doubt related to malignant pemphigus, is a special disorder of infectious character, running a definite course, the distinctive factor in which is as yet undetermined, the changes wrought being obviously secondary in character and importance.

Fox¹ reports the case of a married woman, 57 years old, affected with pemphigus vegetans. "Spots" about the neck were followed by penny-sized blebs in the axillary region, also here and there over the thorax, the neck, and the limbs. The lesions became crusted, occurring in crops and after rupture, warty growths developed springing from the base of the bleb and spreading centrifugally. The patient recovered under the use of arsenic.

Pemphigus of Mucous Surfaces.²—In almost all grave forms of pemphigus the mucous surfaces are involved in various degrees, including the lining membrane of the mouth, the vulva, the anus, the eye, etc. Tamerl³ recognized the presence of blebs in the œsophagus by œsophagoscopy.

In these regions the lesions may be few or numerous, the bullæ rounded, translucent, when unbroken slightly elevated above the general level, but often first subjected to examination after rupture. Mandelbaum⁴ calls attention to bleb-formation in the mouth (tongue, pharynx), and larynx which may precede the development of similar lesions in the skin. In this event one sees merely the reddened floor of the lesion from which the limpid or dark-reddish contents of the bleb have escaped or are escaping. Commonly there is a vivid areola about the macule. After the lapse of time the floor resembles merely a diphtheroid patch or a spot which has been pencilled by silver nitrate. The lesions of the mucous membranes as in cutaneous manifestations of pemphigus may be either acute or chronic; as a rule they suggest an element of gravity in the cases in which they develop. Adhesions occur but rarely at the points where the membrane has been laid bare.

¹ B. J. D., 1908, xxvi, p. 181.

² Cf. Charles, *Rev. hebdomad. de Laryn., d'Otolog. et de Rhinol.*, 1902, xxiii, p. 337. Also Coeks, *J. A. M. A.*, 1906, Nov. 24, p. 1736 (report of fatal case of pemphigus with lesions limited to the mucous membranes). Charles, *Rev. Ital. d. mal. de Laryng.* cited in *Archiv*, 1904, lxxii, p. 135 (three cases, some of acute and some of chronic course).

³ *Wien. klin. Wochenschr.*, 1904, No. 29.

⁴ *Berl. klin. Wochenschr.*, 1892, No. 49.

Pemphigus in Children.—The acute form when affecting children is characterized by the sudden evolution of semi-transparent bullæ of the skin and the mucous membranes, the contents of the lesions becoming gradually opaque. There is usually a narrow red halo about each. The syndromes are fever, chills, and malaise, the latter increasing as the eruption spreads. Recovery or fatal termination usually occurs within a few weeks.

The chronic, or better the recurrent, form displays lesions at intervals of a few days and the surface of the skin exhibits in successive crops well formed blebs. There may be, as in the acute form, a febrile movement, though usually this last is absent. There may be a fatal result.

After a survey of the pathological findings by Kreibich, Kromayer, Luithlen, Buzzi, Joseph, Jarisch and others, even admitting that diplococci, staphylococci, and streptococci have been recognized in sections of tissue, the fact remains that the negative findings are almost equally numerous and the contents of the pemphigus blebs are often sterile; the neuropathic origin of the disease is scarcely to be disputed.

POMPHOLYX.

(Gr., *πομφόλυξ*, a bubble.)

(CHEIRO-POMPHOLYX, DYSIDROSIS. *Fr.*, DYSIDROSE.)

Pompholyx is a form of pemphigus affecting the skin of the hands and feet, occasionally also contiguous parts, where variously sized vesicular and vesico-bullous lesions develop.

This disorder has been the theme of no little discussion. It was described first by Tilbury Fox in 1875, Hutchinson¹ reporting on the same case.

Symptoms.—The disease affects simultaneously and, as a rule, symmetrically the hands and the feet; if either organs are spared, it is commonly the feet. One side may be involved more extensively than the other. The eruption is preceded or is accompanied by a burning or a tingling pain, rarely with severe itching, and is characterized by the appearance on the dorsum, or the sides of the fingers, or over the palms and soles, or over the whole hand or foot, of deeply set, single or numerous, grouped or confluent pin-head- to bean-sized vesicles, or of vesico-bullæ. According to Fox, in the earliest stages

¹ Literature: Tilbury Fox, *Amer. Jour. of Derm.*, 1873, p. 476; also *Brit. Med. Jour.*, 1873, Sept. 27. Hutchinson, J., *Ill. Clin. Surgery*, 1876; London, Fasc. iii., Pl. x. Robinson, *Archiv*, 1877, iii., p. 4; also Morrow, *Syst. Derm.*, vol. iii., p. 182 (Art. Pompholyx, by Robinson). Crocker, *Trans. Path. Soc. of London*, 1878, x., xix. Unna, *Histo-pathology*, p. 176. Levisseur, *Contribution to the Clinical Aspect and Treatment of Pompholyx (Dysidrosis, Cheiropompholyx)*, 14 cases, *J. C. D.*, 1905, xxiii., pp. 432-439. Nestorowsky, *Die anatomischen Veränderungen der Haut bei Dysidrosis*, *Zeitschr.*, xiii., pp. 183, 357, 421; *Annales*, 1906, s. iv., vii., p. 978. For further bibliography, see Santi, *Monatshefte*, 1892, xv., p. 93.

of the vesicles annular collections of fluid may be seen about the sweat-pores. The appearance of well-developed lesions is compared with that of boiled sago-grains imbedded within the skin. When the bullæ attain extreme development the distended lesions, as large as pigeon's eggs, project from the skin, these lesions being irregularly outlined and containing a neutral or an alkaline fluid, translucent or turbid, and seated on an œdematous, often exquisitely painful

FIG. 69.



Dysidrosis (Howard Fox).

and sensitive skin. The bullæ are said not to rupture spontaneously, but to undergo absorption in a fortnight or more, with exfoliation of the loosened epidermis; but there are well-marked exceptions to the rule. Beneath the purposely ruptured bullæ is a new-formed and reddened or exfoliated and sodden (which under favorable circumstances becomes later a sound) epidermis. There may be coincident malaise, thermal changes, marked mental despondency, or hebetude. Hyperidrosis may be a prominent feature in the case of affected patients before and during the occurrence of the disease. There may be recurrent attacks in consecutive seasons, and also recrudescence of the disease in the affected. Mild types of the disease occur which it is difficult to distinguish from pemphigus benignus. In Leveiseur's observations, the nails are sometimes shed.

Etiology.—The disease is somewhat rare, occurs rather more often in women than in men, though both sexes are attacked. The ages extend from childhood to middle life; one well-marked case occurred in a man of sixty. The sufferers, with but few exceptions, are in poor health, are broken down from nervous overstrain, and are neurasthenic rather than cachectic.

The disorder is in certain subjects due to strictly inherited tendencies. We have had under observation typical cases in the person of a mother and two children, one of the latter a girl, all of whom

had suffered since birth from successive crops of vesico-bullous lesions with hyperidrosis of the hands and feet. The heart of each was in an irritable state, the pulse rate of the mother having been repeatedly registered at 122 to the minute. All three patients complained of gastric crises.

In France a number of disorders accompanied by coldness and sweating of the hands and feet, and characterized by lesions limited to these organs, are cited as instances of dysidrosis. Thus, a passive erythema and areas of congestion of the skin of the organs named, displaying non-bullous lesions, are commonly set down in Paris as illustrations of dysidrosis. It is usual in America to limit the titles dysidrosis and pompholyx to the affection here described with marked preponderance of vesico-bullous lesions as hand and foot symptoms.

In all cases the heart should be examined and the condition of the circulation carefully determined. Organic and functional cardiac disease is responsible for many cases.

Pathology.—The differences among observers respecting the character of the disease depend upon whether the view is taken with Fox, Crocker, and others, that the vesicles lie directly connected with or in the line of the sweat-duct; or whether, with Hutchinson, Robinson, and others, no connection with the coil-glands is recognized, the vesicles lying in the superior portions of the rete over the papillæ, and not over the rete-pegs which pass below to meet the ducts of the coil-glands. Crocker, however, found lesions in both situations. Unna believes that a micro-organism resembling the tubercle-bacillus is responsible for the disease.

Nestorowsky summarizes the views of the French school on the subject of dysidrosis, asserting as the result of his anatomical researches, that the process originates in augmentation of the secretion of the sweat glands with dilatation of the excretory canal but that dysidrosis occurs in persons whose hands never sweat, and also that in many cases of hyperidrosis there are no symptoms of dysidrosis. Briefly, the original cause is to be sought in disorders of the nervous centers, but a predisposing factor is the sweating in a hand or foot of weakened resistance. When the cause operates efficiently, the horny layer of the epidermis becomes swollen, the sudoriparous canals are blocked with horny substance, and cystic dilatations of the sweat-channels result, some of which rupture and release the effused fluid. The result is swelling, vacuolation, granulation, and even necrosis of the cells. Under the influence of the pressure produced by the swollen cysts, the excretory conduits may form vesicular loops in the upper, middle, and, more rarely, the lower portions of the rete; vesicles also form in the horny layer above the stratum granulosum, partly from pressure and in part from imbibition of the fluid effused. The blebs are formed by confluence of smaller lesions.

By many writers the disorder is no longer regarded as a distinct disease, but is properly classed with other forms of pemphigus.

Diagnosis.—Pompholyx is to be differentiated from eczema. The

tendency of the vesicles to persist, and after rupture to fail to furnish a serous exudate, is strikingly different from the course of eczema. Again, there is seldom, if ever, in well-marked pompholyx a tendency to change in type from a serous to a pustular exudation. Lastly, eczema of the palms and the soles is almost invariably of erythematous type. It differs from pemphigus in the absence of cyclical phenomena, in its special localization, and in its frequent vesicular origin.

Treatment.—The internal treatment of these cases is of importance. Patients require the best climatic and hygienic environment and mental distraction. In male patients, the use of coffee, tea, and alcoholic beverages is to be interdicted. In the way of medicaments, quinine, nux vomica, arsenic, iron, the mineral acids, ergot, cod-liver oil, matzoöl, and kumyss may be needed. The local treatment is by employment of diluted black-wash, lead-water, oleated lime-water with zinc oxide or bismuth subnitrate, or Lassar paste covered with boric or salicylated powder; or by the application of strips of muslin spread with lead or with zinc salves. Crocker recommends the zinc or lead oleate. In other cases solutions of silver nitrate (grains v to 5j [0.33–30.]) or of ichthyol 50 per cent. with water are efficacious. Levisseur¹ recommends xeroform powder applied on cotton and firmly bound over each individual finger.

HYDROA VACCINIFORME.

(RECURRENT SUMMER ERUPTION, HYDROA PUERORUM. *Fr.*, HYDROA ÆSTIVALE.)

Hydroa vacciniforme is a recurring vesicular disease, occurring chiefly in the summer season in the persons of young adult male subjects and solely on exposed parts of the cutaneous surface.

This disease was described first in 1861 by Bazin and later by Hutchinson, Jamieson, Brooke, Crocker,² Bowen,³ Graham, White, Brocq,⁴ and others.

Symptoms.—The disease usually begins during the first three or four years of life and gradually disappears during the few years following puberty. With but few exceptions the cases reported have been in boys. The disease is most active in summer, the larger numbers of patients remaining free from active manifestations during the winter months. The direct cause in most cases is exposure to the sun's rays, though exceptionally warm or cold winds, or even artificial heat, seem sufficient to cause an outbreak.

The eruption is symmetrical and is limited to the uncovered parts of the body; the bridge of the nose, cheeks, and ears, and the backs of the hands being the parts most affected. Bazin, however, reported

¹ Loc. cit.

² Diseases of the Skin, 1893.

³ J. C. D., 1894, xii., p. 81 (with review of literature, and histology).

⁴ Annales, 1894, s. iii., v., p. 1003.

cases in which covered portions of the body were slightly involved. We have under observation a case (the subject of the accompanying illustration) in which a new crop of vesicles and bullæ on the face is accompanied at times by an herpetic keratitis, the resulting scars interfering considerably with vision. The disease occurs in successive outbreaks, each of which lasts for two or three weeks. The intervals between recurrences in the summer may be several weeks, or so brief as practically to be wanting. The lesions often are preceded by sensations of heat or itching; and the first to appear are red macules or elevations, upon which rapidly are formed vesicles or bullæ, varying in size from that of a millet-seed to that of a large pea, and occurring either singly or in groups like herpes; they may coalesce and may be surrounded by a halo. These vesicles may dry in a day or two, or they may rupture and form a crust, but many of the larger become depressed in the centre and resemble a vaccination-vesicle. The depressed centre is black or dark blue, and is surrounded by a ring of fluid, while about the whole is a reddened areola. Some of the lesions may become purulent. The dark centre is converted rapidly into a thick, black crust which is very adherent, and which on falling leaves a depressed, reddened scar that eventually becomes white and practically indistinguishable from that of variola. The duration of an individual lesion from its beginning to the formation of the crust is three or four days. The time required for the crust to fall is variable.

The eruption usually is preceded by some slight constitutional disturbance, and by burning or pain at the site of the lesions. Itching is absent, as a rule, though it was marked in Bowen's case.

Etiology.—Exposure of sensitive skins to the sun and wind, especially in the summer season, is the effective cause. We have observed patients in whom the disease was developed not merely in summer, but in winter when the sunlight was reflected from snow on the ground. Ehrmann¹ showed that light passed through blue glass was just as potent in causing the eruption as the sun's rays, but when the light was passed through red glass which absorbs the caloric rays no lesions resulted. He concluded that the eruption is of photo-actinic origin.

Pathology.—The pathology has been studied by Bowen in two lesions taken from a single patient, and Mibelli.² In the primary stage Bowen found merely vesicle-formation in the middle layers of the rete. In a more advanced lesion he found necrosis involving the lower layers of the stratum corneum, the entire rete, and the corium nearly to the subcutaneous tissue. He concluded that the process begins as an inflammation in the epidermis and upper part of the corium, followed by vesicle-formation in the rete, and later by the necrosis described above. The necrosis is sharply circumscribed, and showing through the vesicles above, produces the black centre of the

¹ Archiv, 1905, lxxvii., p. 163.

² Monatshefte, 1897, xxiv., p. 87.

advanced lesions. Bowen further calls attention to the points of similarity between this disease and those of *acne necrotica*, or of *acne varioliformis*.

Diagnosis.—The diagnosis is from erythematous lupus, pemphigus, erythema bullosum, and dermatitis herpetiformis. The limitation of the lesions to the exposed parts of the body, the presence of vesico-blebs, and the scarring, in connection with the age of the patient, all point to the nature of the malady.

Treatment.—The treatment is unsatisfactory. To prevent recurrence the patient should be guarded from exposure to the sun and in some cases from hot or cold winds. Veils and coverings which exclude the light may be of service. Crocker recommends treating the eruption by opening the vesicles and applying iodoform in powder or in solution in ether. After removing the crusts with carbolized oil the surfaces may be dressed with an ointment containing iodoform and boric acid.

Prognosis.—The prognosis is unsatisfactory, as until adult years are attained the patient is liable after fresh exposure to recrudescence of the disease.

ACRODERMATITIS PUSTULOSA HIEMALIS (Crocker).

Under this title Crocker described a condition similar, if not identical with folliclis. He has seen three cases and described it as follows:

“The lesions are excited or kept up by the cold, affect the hands only, especially about the knuckles and sides of the fingers, and take the form of indolent, indurated papulo-pustules, isolated and few in number at a time; but the disease as a whole persists by a succession of lesions throughout the winter and early spring.

“They begin as hard, brown, large pin-head points, but later as if there was a ‘thorn on the flesh.’ If opened early serum escapes, but later pus forms around the peg and the whole is situated on an elevated inflammatory pea-sized base. The center is cast off leaving a scar. Some of the indurated nodules do not suppurate.”

The chief difference between this disorder and folliclis appears to be only one of limitation in location as the lesions are identical in the two disorders. Crocker¹ suggests nitroglycerine internally with local treatment by vasogen-iodine.

EPIDERMOLYSIS BULLOSA HEREDITARIA.

(ACANTHOLYSIS BULLOSA.)

This name has been given to a rare affection or condition of the skin in which there is a pronounced tendency to the rapid formation of bullæ wherever the integument may be slightly bruised or rubbed.

¹ Crocker, 3d ed., pp. 350-351.

Cases have been reported by Goldscheider, Köbner, Valentine, Elliott,¹ Beatty,² Bowen,³ Wende,⁴ and others.⁵ In the majority of cases reported the condition had existed from infancy or early childhood, and there was a clear history of heredity. Valentine reported eleven cases which occurred in four generations of the same family.

The general health of individuals thus affected may be excellent and the skin remain sound so long as it is subjected to no irritation, but in some cases very slight causes (the pressure of a shoe in walking; the grasping of a firm substance, such as the handle of a hammer; the friction of suspenders or waistband) are sufficient to cause the appearance of firm, tense, blebs at the site of the irritation. Such bullæ vary in size from that of a small pea to that of a walnut. They often last some days, having a firm roof-wall; are usually more or less painful, especially after rupture; and disappear without leaving either pigmentation or scar. The predisposition to the formation of new bullæ, however, remains indefinitely. In Bowen's case the bullæ were often hemorrhagic in type and were followed by pigmentation and scarring.

Histology.—Engman⁶ found an absence of elastic tissue in the papillary and subpapillary regions of the derma, elastic fibres were sparsely distributed and deformed in the deeper regions of normal skin.

EXANTHEMATA.

(Gr., ἐξάνθημα, blossoming, flowering.)

For a detailed consideration of the phenomena of the exanthematous fevers the reader is referred to the standard treatises on the subject in the field of general medicine. Space is allotted here merely to a description of the cutaneous lesions by which they are severally characterized. These are unlike in each disease, yet all exhibit certain common characteristics. In all the eruptions are symmetrical, and in typical cases are general. In each the efflorescence is succeeded by a desquamative or exfoliating condition of the skin. In each there is, within relatively fixed limits, a distinct stadium of the pathological process within which it is completed, and beyond which, however persistent may be its remote sequelæ, there is no chronic manifestation of the disorder. Each, also, is produced solely by its specific contagium, derived exclusively from an animal body affected with the same disease, being never, so far as known, generated from any other source, nor merging by imperceptible degrees the one into another. Two of these may rarely concur, but under such circumstances the one is always more pronounced in its features, which either

¹ J. C. D., 1895, xiii, p. 10; *ibid.*, 1899, xvii, p. 539; and N. Y. Med. Jour., April 21, 1900.

² B. J. D., 1897, ix., p. 301. He gives a *résumé* of all previously reported cases.

³ J. C. D., 1898, xvi., p. 253.

⁴ *Ibid.*, 1902, xx., p. 537 (recent bibliography), and *ibid.*, 1904, xxii., p. 14.

⁵ For complete bibliography, see Luithlen, Mraček's Handbuch, i., p. 737.

⁶ J. C. D., 1906, xxiv., p. 55.

closely precede or follow those of another. No specific medication is known to be capable of arresting any one of them, each pursuing its course uninterruptedly to a favorable or a fatal termination, according to the intensity of the poison present in each case and to the more or less favorable or unfavorable conditions of the sufferer. Finally, it is probable, though not at present demonstrable, that specific microorganisms are etiological factors in the production of each.

RUBEOLA.

(MEASLES, MORBILLI. *Ger.*, MASERN, FLECKEN; *Fr.*, ROUGÉOLE; *Ital.*, ROSOLIA; *Sp.*, SERAMPION.)

Symptoms.—After an incubation period of nine to eleven days prodromal symptoms of the disease appear; fever (102° – 104° F.), chills, rarely convulsions, incessant, hacking cough, and catarrhal inflammation of the conjunctiva, nasal mucous membrane, and larynx. Prodromal rashes are also found in carefully observed cases; there may be urticarial, erythematous, or scarlatiniform lesions; Rolleston in 30 cases records these occurrences in 42.8 per cent. observed. The most important recent contribution to the literature of measles includes another manifestation of the period of invasion: Koplik's spots. They appear on the mucous membrane of the palate, uvula, lips, and cheeks of nearly 90 per cent. of patients, often as early as seventy-two hours before the appearance of a characteristic exanthem. Pin-head- to split-pea-sized bluish-white glistening spots or brilliantly red patches with a bluish-white punctum centrally situated in each become visible. The value of this early sign of the disease has been corroborated by other observers.¹

Period of Efflorescence.—The eruption of measles usually appears on the morning of the fourth day first upon the face (the forehead and temples), and thence extends in about thirty hours over the neck, the upper portion of the trunk, and the superior extremities. Between the fourth and sixth day of the disease it usually attains its deepest shades of color and its maximum of development over the entire surface of the body, including the palms and the soles. This maximum attained, the eruption gradually fades; the tumid condition of the skin, most noticeable on the face, also subsides; the catarrhal symptoms and cough become less annoying; and the patient enters upon the period of desquamation.

The eruption is almost invariably symmetrical, and is characterized by the occurrence of a diffuse reddish, yellowish-red, mulberry-red, deep raspberry-red, or, in extreme cases, violaceous-tinted coloration of the skin, or of pea- to small finger-nail-sized (a millimetre to a centimetre in diameter), oval, round, or irregularly shaped, fairly well-defined macules, either not elevated or very slightly raised above

¹ Filatou, *Acute Infectionskrank.*, 1895; Weiss, *Wien. klin. Wechschrft.*, 1899, xii., p. 683 (abstr. in *B. J. D.*, 1900, xii., p. 33); Williams, *Bristol Med. and Chir. Jour.*, 1900, xviii., p. 139 (abstr. in *B. J. D.*, 1900, xii., p. 331).

the general level of the integument; or by the occurrence of large pin-head-sized, discrete papules, much more rarely pin-point-sized vesicles, corresponding in color with the shades described above, and highly suggestive of the first efflorescence in variola. These lesions become pale under pressure, exhibiting then a yellowish tint, and often are set together closely, particularly over the upper segment of the body, in patches suggesting a crescentic outline. The term "suggesting" is used here purposely, as it is difficult, by selecting a single patch, to determine by the eye alone the existence of such a configuration; while an examination of the eruption as a whole may often very clearly convey this impression to the sight. Usually, patches of sound skin can be recognized even when the eruption appears to be confluent, complete confluence never occurring so as to form a sheet or mask over the entire skin-surface. Individual lesions may so merge as to be well-nigh indistinguishable separately; yet, on the whole, the eruption deserves fully the plural character of its English name. It is made up in all cases of innumerable elements, whose identity is never wholly lost. The subjective sensation awakened is occasionally a severe itching or burning; frequently this is an insignificant matter compared with other disagreeable symptoms—the cough, coryza, and fever.

The exanthem spreads from the face to the upper extremities on the second day, and over the lower limbs on the third day of the rash. Its complex expression usually coincides with decided aggravation of the catarrhal symptoms.

Period of Desquamation.—The decline of the disease is accomplished usually with cessation of fever and the production of delicate yellowish-brown pigmentations of the surface where the elements of the eruption have existed, involution being manifested first in the site of the lesions which were earliest to develop. The scaling when present is usually of moderate grade. Gradually and simultaneously the catarrhal symptoms of the respiratory passages diminish in severity. This final stage of the disease in favorable cases usually is terminated in a fortnight from the date of invasion.

The complications and anomalies of measles depend upon the intensity of the poison, displayed in the most formidable symptoms where human beings are crowded together, as in camps and prisons; upon the degree of physical vigor; and also upon the various hygienic surroundings, of the victims of the disease. Thus, the period of efflorescence may be unusually prolonged; the eruption may disappear suddenly, and as rapidly reappear; the cutaneous symptoms may alone be wanting; the latter may be commingled with petechiæ due to cutaneous extravasation of blood, which may also be accompanied by severe epistaxis; and the catarrhal condition of the mucous surfaces affected may terminate in croupal or in diphtheritic disease, may be followed by capillary bronchitis, catarrhal pneumonia, and even by pulmonary tuberculosis. Typhoid conditions may also supervene, and chronic inflammatory affections of the eyes and of the Schneider-

ian membrane result. Measles, scarlet fever, and other exanthemata may concur.¹

Etiology.—The disease is infectious and contagious, being communicable from person to person, the virus being transmitted less readily by the medium of fomites than in other exanthemata, and usually rendered innocuous by exposure to sunlight and air. The malady is infectious in all stages even before that of eruption; and the effective agent is present in the blood as shown by inoculation-experiments during the prodromal stage. Susceptibility, save in those protected by previous infection, is general, though second attacks of the disease are on record, the most of such, however, being open to suspicion, since roseola (German measles) may follow rubeola. In the human family all ages and both sexes are liable to contract the disorder, and it is believed that animals are not exempt.

The disease has been demonstrated to produce itself by contagion two to four days before the appearance of the rash, while the capability of transmission is usually lost between the twentieth and the thirtieth day after the exanthem is fully developed.

Pathology.—The pathology of the cutaneous lesions in measles is that merely of acute hyperæmia occasionally passing into exudation, limited for the most part to the vascular papillæ of the corium and the perifollicular plexuses of blood-vessels. There is œdema of the fatty tissue surrounding the coil-glands, in the sheaths of the larger vessels, the cutaneous muscles, and the hair-follicles. The coils, follicles, and muscles seem to swim free in widely dilated spaces. There is no cellular exudation and no mitosis (Unna). Post mortem the eruption fades, as the result of gravitation of the blood from the anterior aspect of the body as it reclines upon the dorsum.

Bacteria of small size and remarkable motility have been found in the blood by Coze and Feltz; micrococci in the trachea by Klebs; spherical bodies in the breath of children, and post mortem in the lungs and liver by Braidwood and Vacher; and similar organisms in the vesicles and pustules of malignant measles by Keating and Formad.² Lessage,³ studying the disease in 200 cases, often cultivating a delicate micrococcus on gelose, reports a production of something like the disease by inoculation.

The disease is chiefly one of infancy, probably because at that age there is always the largest number of individuals unprotected by previous attacks. In every case the malady results from contagion, mediate or immediate, from an infected human subject. It spares neither age nor sex, though it is much rarer in advanced years than in other periods of life, probably because of the large number who at such period enjoy immunity.

Diagnosis.—The diagnosis of importance is between scarlatina and variola. Typical cases with a well-developed eruption can

¹ Williams, "Rubeola, Scarlatina, and Fourth Disease," Brit. Med. Jour., 1901, ii., p. 1797.

² Cf. Canon and Pielicke, Sternberg's Magnan's Bacteria, New York, 1884.

³ Bull. de la Soc. méd. des Hôpit. de Paris, March 15–20, 1900, 3 s., xvii., p. 282.

scarcely be mistaken if the symptoms displayed are assigned their full weight. It would be useless, however, to deny the fact that atypical forms occur which have confused the most expert diagnosticians; in all cases of doubt the prudent practitioner will refuse to decide as to the nature of the disease until unmistakable symptoms, in the lapse of time, have been declared. The resemblance between ill-developed measles and certain of the eruptions seen in varioloid is striking, and the greatest skill, at a given moment of time, will in cases fail to make a decision between the two. A distinctly crescentic character of the eruption, the prevalence of an epidemic, the discovery of Koplik's spots, the presence of catarrhal symptoms, the continuance of fever after the efflorescence is completed, the color of the eruption, and the discovery of the nature of the disease from which the contagion was derived, all point to the truth. From scarlatina measles is differentiated much more readily by the macular or papular elements of its eruption; by their cyanotic, darker hue; by their appearance to a marked degree upon the face; and by the absence of the sore throat, tenderness of the neck, and characteristic "strawberry tongue," and usually intense febrile access of the first-named disease. From the various forms of erythema accompanied by fever, as well as from the medicinal rashes, insect-bites, and syphilitic eruptions, measles can be distinguished by the irregular temperature-record as well as by the character of the eruption. The diagnosis between rubeola and röteln is given later.

Treatment.—The treatment of measles should be limited to careful hygienic attention to the invalid, including a restricted "fever diet," and to the strictest isolation, disinfection, and ventilation, and to the use of only such medicaments as especially are indicated. The antithermic remedies employed in the general management of the febrile process may be required in special cases.

In the way of local treatment the skin should be anointed with a bland, oily, or fatty substance, to relieve the pruritic sensations, especially after sponging of the surface once daily with a weak alkaline solution, which may be used cool without fear of producing "repercussion" of the exanthem. The chamber of the invalid should be somewhat darkened for the sake of the eyes, but pure air should constantly be admitted.

Prognosis.—The prognosis is in general favorable, but is of the gravest in special conditions. All the complications named above increase the gravity of the disease, which is also enhanced among men crowded together in camps, children in public charities, pregnant women, the cachectic and those greatly enfeebled from disease, very young infants, old men and women, and residents of islands that have been long unvisited by epidemics of the malady.

RÖTHELN.

(RUBEOLA, RUBEOLA NOTHA, RUBELLA, GERMAN MEASLES, HYBRID OR BASTARD MEASLES, FRENCH MEASLES, EPIDEMIC ROSEOLA. *Fr.*, RUBÉOLE; *Ger.*, RÖTHELN.)

Symptoms.—This is a disease which occurs in epidemics, sporadic cases are not recognized. The contagiousness varies in different epidemics. The period of incubation is usually from two to three weeks but the disease may develop twenty-four hours after exposure.

Enlargement of the posterior cervical glands is one of the most striking features of the disease, occasionally glands in other parts of the body are enlarged. This symptom is not observed in measles. There is usually no fever; when such is present it only lasts for the first two days of the illness; in an average case the temperature runs from 100° F. to 102° F. though it has been known to reach 104° F. in rare instances. Prodromes, such as malaise, cephalalgia, articular pains, nausea, and vomiting are quite exceptional.

The eruption is usually the first evidence of disease; its polymorphous character is the most striking feature; it may present the appearance of scarlet fever on one part of the body and of measles on another part; or in a given epidemic one patient may have a scarlatiniform eruption and another patient a rash of morbilliform type.

The eruption occurs for the most part in the regions affected by measles, first on the face and scalp, later on the neck, the trunk, the upper and finally the lower extremities, in the form of multiple, discrete, pin-point- to small pin-head-sized macules, but smaller than the lesions displayed in that disease, and decidedly lighter in color. The shade is from a rosy or pinkish to a crimson red, rarely lurid, never of dark mulberry or violaceous hue. This color at times will be perceptible beyond the line of the lesions as a delicate halo, a circumstance which strongly distinguishes the exanthem from morbilli. The lesions, moreover, seldom are arranged in crescentic outline, more often being grouped in roundish or oval patches. Often, indeed, the elements of the eruption are discrete and disseminated, and after complete evolution may be elevated slightly above the general surface. The fauces occasionally are reddened in puncta. The eruption commonly fades in from a few hours to one to two days, and there may be slight resulting cutaneous desquamation.

The objection¹ to regarding rötheln as a clinical entity has been answered by the observation of epidemics in wards full of patients, simultaneously affected and all presenting mild symptoms.

Etiology and Pathology.—The disease occurs in epidemic form, is distinctly infectious and contagious, attacks an individual but once in a lifetime, affords no immunity in subsequent exposure to either measles or scarlatina, and attacks usually young subjects.

Diagnosis.—The epidemic character of the disease, its mildness,

¹ Dillingham, *Amer. Med.*, 1903, vi., p. 263; Griffith, *Phila. Med. Jour.*, 1902, ix., p. 659.

the sudden appearance of an eruption without prodromes, the transitory character of the fever, the adenopathy, its occurrence in children who have previously had measles, together with the character of the eruption as described above are the points on which to rely for the diagnosis. Erythema caused by gastro-intestinal autointoxication must be considered.

Treatment.—Rötheln should be treated by rest in bed, an abundant supply of fresh air, strict asepsis, and the usual diet of fever-patients. Medication by drugs rarely is indicated.

SCARLATINA.

(SCARLET FEVER, SCARLET RASH, CANKER RASH.
Ger., SCHARLACH; *Fr.*, SCARLATINE.)

The period of incubation of scarlet fever varies between twenty-four hours and six days, the average duration being about three days. The reason of this variation is to be sought, not in any changeability in the mode of evolution of the disease, but in the fact that its poison is less volatile and less rapidly dissipated than is that of measles, the result being that it may remain potential for longer periods in connection with articles through the medium of which it is transferred from one individual to another. This incubative period, like that described in connection with measles, may be unproductive of physical symptoms, or may be associated with ill-defined malaise.

Symptoms.—The prodromes are of importance in diagnosis. There is an abrupt onset to the disease. The attack begins with vomiting, a slight headache, or a characteristic sore-throat. In children a convulsion is frequently the first symptom. On examination the patient is found to have a rather characteristic rapid and bounding pulse, an exceedingly dry skin, and a high body-temperature (102° – 105° F.). Where the mouth is examined, the tongue is seen to have a creamy white coating through which the red filiform papillæ protrude; this is the so-called "strawberry-tongue." The velum, the pillars of the fauces, the tonsils, and all exposed mucous surfaces are engorged, tumid, reddened, and often covered with deep reddish puncta, which represent hyperæmia of the perifollicular tissues. In severe cases the mucous surfaces may speedily exhibit finger-nail to pigeon-egg-sized ashy ulcerations with a lurid halo at the periphery. On the first visit the physician should note the condition of the lymph glands; those of the neck are usually somewhat enlarged, and those in the groin may be swollen. In children there may be syncope, delirium, convulsions, or when the toxæmia is intense the result may be fatal before the eruption appears. In some cases purpura which is frequently mistaken for hemorrhagic small-pox appears in this fulminating form of the disease. This prodromal period usually lasts from twelve to twenty-four hours, though it may be prolonged for two days more. In this respect scarlatina is markedly distinguished

from measles. This stage is terminated by the appearance of the exanthem, but the fever persists without abatement after the explosion; and the other symptoms of the disease are then in no wise ameliorated. Authors describe three distinct types of the disease: the simple, the septic, and the toxic.

The eruption in scarlatina usually spares the face, however much the latter may display two damask-colored cheeks under the febrile flush, may become tumid with the blood pumped through the throbbing carotids, or even may exhibit a few scanty lesions upon the forehead and temples. About the mouth the integument is generally pallid; this is far different from the picture presented in measles. The eruption thence spreads rapidly downward over the neck, the trunk, and the extremities in symmetrical development, being often conspicuously prominent over the elbows, the backs of the hands and feet, and the belly. The rash is exhibited, first, in the form of light- or deep-red pin-head-sized puncta about the hair-follicles, closely agglomerated; and, second, in the form of a superadded erythema, giving to the eye the impression of a diffuse reddish blush. The rash develops early about the neck and the clavicular regions, and it rapidly spreads to the trunk and extremities, including the dorsal surfaces of the hands and feet, attaining complete development in the course of the second day. It is then of a distinctly scarlet color, whence the disease derives its name in Latin, English, and German, a coloration frequently compared with the appearance of a boiled lobster. Upon the limbs it often is developed in punctate form, while the occurrence of a diffuse scarlet blush is perceived most distinctly by the eye in the examination of the trunk, where the rash is seen to fade under pressure. In any event the erythematous blush commonly disappears before the individual elements of the rash are removed. The eruption can be made to disappear on pressure in the early stages of the affection. Drawing the finger-nail rapidly over the surface of the skin is followed by the formation of a whitish-yellow line, which persists for a time sufficient to enable one to describe a letter upon the skin. This period of efflorescence lasts for from one or two days to an entire week, during which the febrile and other symptoms continue unabated.

The rash usually persists at its maximum of development from one to three days, the concomitant symptoms continuing without noticeable abatement. Among the latter may be named the occurrence of albumin in a urinary secretion of diminished specific gravity, with occasionally the presence of epithelium, recognizable under the microscope as derived from the lining membrane of the uriniferous tubules of the kidney.

Having attained its apogee, the eruption in favorable cases begins to fade, the part first affected exhibiting earliest a lighter shade, while the other pathological phenomena diminish in severity, the sore-throat, especially in ulcerated conditions, alone persisting. In from four to ten days longer the eruption disappears, leaving a brown-yel-

low pigmentation of the skin-surface; simultaneously the other symptoms of the disease vanish.

The desquamation which ensues as convalescence progresses is general, and is often proportioned in extent to the severity of the preceding eruption, though it may be generalized after a well-nigh imperceptible exanthem. Desquamation is more pronounced and characteristic in scarlatina than in any other of the eruptive fevers. It may be superficial and furfuraceous in character, or the epidermis may fall in lamellated layers; for example, the sheath of an entire finger, with the nail, or that of the entire palm. In this way sheets, ribbons, and shreds of the horny layer of the skin may fall from its surface and expose a new and often tender epidermis beneath. The hairs may simultaneously be shed. When this desquamation is finished the stadium of the disease may be regarded as concluded, the entire period lasting in uncomplicated cases from a fortnight to a month or six weeks.

Septic (Anginose) Scarlatina is characterized by the gravity of the throat-symptoms. In such cases a parenchymatous inflammation of the tonsils, velum, and fauces supervenes at an early period, with enormous tumefaction, involvement of the submucous tissue and neighboring glands, and ulcerative, suppurative, and even gangrenous complications which speedily may prove fatal.

Toxic Scarlatina (*Scarlatiniform Typhus*; *Fr., Scarlatine Foudroyante*).—This severe type of the disease is that in which symptoms of typhus are pronounced. Here the patient may perish within a few hours after attack and before the eruption appears, exhibiting comatose or convulsive symptoms, indicating the profound influence upon the nervous centres of the intensely intoxicated blood; or the eruption may appear ill developed, often livid, hemorrhagic, or petechial in type, and be followed by albuminuria, meningitis, diarrhœa, coma, and death.

The *Complications, Anomalies*, and remote *Sequels* of scarlatina are so numerous as to furnish a vast array of facts for the study of the pathologist. The reader need merely be reminded in these pages that the usual incubative and prodromic stages of the disease may be brief as to time, or be followed so brusquely by eruptive phenomena as to be indistinguishable. The latter may also first occur upon the extremities or trunk, and later on the neck and over the clavicles; or at once cover the totality of the surface by a rapid explosion, or be extremely short-lived, or be altogether absent, or be unusually prolonged and visible for even a fortnight upon the surface of the body, appearing and well-nigh disappearing without appreciable cause. To a proportionate extent the stage of desquamation may be reached precociously or tardily, and the exfoliating process tediously be prolonged and of intense type, jeopardizing in this manner the future of the convalescent prostrated by the fever which has passed or the sympathetic fever which may thus be awakened.

The anomalies of the scarlatinal rash are numerous, but they de-

pend, in general, less upon a variation in the intensity of the poison than upon the physical condition of the patient. Thus, the affected surface may be elevated slightly above the general level; there may be no coincident pyrexia; the skin may exhibit irregularly disposed mottlings and maculations; the rash may be characterized by the occurrence of miliary papules, minute vesicles, blebs, or purpuric lesions, well defined against the general scarlet color of the skin by their violaceous shade and due to cutaneous extravasation of blood. The rare bullous, pustular, and urticarial lesions which may appear upon the skin are accidental and bear no relation to the specific history of the disease.

Catarrhal and parenchymatous nephritis is justly dreaded during the desquamative period of the malady, when it may prove fatal after a relatively benignant manifestation of the disease in its prodromal and eruptive stages. Gastro-intestinal disorders may also prove dangerous. An otitis externa, media, or interna may perforate the tympanum, destroy the ossicles, induce caries of the mastoid process of the temporal bone, and prove fatal by the eventual production of meningitis or phlebitis. To this grave list of disorders which may complicate scarlet fever must be added pneumonia, pericarditis, pleuritis, peritonitis, chronic purulent nasal catarrh (which may result in caries of the nasal bones), destruction of the cornea as a result of severe keratitis, persistent adenopathy of the subcutaneous glands, and malnutrition in many forms, which may so impair the vigor of the constitution as to leave the sufferer a physical wreck for the remainder of life.

Etiology.—The disease is produced exclusively by contagion derived from the animal body affected with scarlatina, either mediately or immediately, and may occur as an epidemic. It attacks individuals of both sexes and all ages, children and infants more frequently, the aged more rarely, probably in consequence of their respective conditions as regards immunity conferred by a previous attack, since, in general, the disease occurs but once in a lifetime. Individual idiosyncrasy must account for the cases in which unprotected infants exposed to the disease fail to receive it, a fact noted occasionally in epidemics of all the exanthemata. The contagious element, which is volatile in its nature, seems to be most active during the eruptive stage of the disease.

Pathology.—Klein, Baginsky¹ Class² and Weaver³ have studied the *Streptococcus pyogenes* which is usually present in scarlet-fever. It is now generally accepted that this microorganism is not the cause of the disease but rather a secondary invader responsible for some of the consequent inflammatory and suppurative lesions. The microorganism which is the causal agent has not been discovered; it is probably not a bacterium. Mallory has described protozoön-like

¹ Berlin. klin. Wehnschrft., 1900, xxxvii., p. 588 and p. 618; *Lancet*, 1900, ii., p. 1234.

² *Med. Record*, 1899, lvi., p. 330 and p. 513; *J. A. M. A.*, 1900, xxxv., p. 799.

³ *Jour. Med. Resch.*, 1903, ix., p. 246.

bodies found in the skin of four cases. Duval¹ has confirmed his findings. The possibility of this protozoön being the cause of the disease is now *sub judice*.

The cutaneous lesions of scarlatina, like those of measles, depend upon hyperæmia due to vascular dilatation of blood- and lymph-vessels, and a moderate degree of exudation. The latter, when it occurs, is limited for the most part to the rete and papillary layer of the corium. There is no diapedesis of leucocytes, though clusters of connective-tissue cells may be demonstrated about the papillary loops of the capillaries. Mast-cells and mitoses appear when desquamation begins; plasma-cells are absent. According to von Jürgensen, the result is a vasomotor paralysis of the peripheral vessels. The signs of the disorder are not apparent in the dead body unless there have been exudation of blood and the consequent formation of petechiæ.

According to Unna, the epidermis, when the disease is fully developed, is the seat of a parakeratosis productive of scaling, while the prickle-layer shows neither œdema nor emigration. In the cutis there is a maximum of congestion without distinct œdema. The general vasomotor disturbance leading to a species of vascular paralysis is supposed to be due to changes in the nervous centres produced by the disease.

Diagnosis.—The diagnosis of scarlatina from measles, rœtheln, erysipelas, and the erythemata in general is established readily. The sore-throat, intense fever, punctiform scarlet rash reaching to the border of the inferior maxilla, and the distinct, whitish-yellow line traceable by the finger-nail when passed rapidly over the surface, are all characteristic. In measles the macular character of the rash and its crescentic arrangement, in connection with the catarrhal symptoms will usually be recognized. From erysipelas scarlatina can always be distinguished by the absence of the peculiar, shining, smooth, or glazed and tumid condition of the affected area. From all other rashes scarlet fever can be distinguished by the pyrexie symptoms and resulting desquamation. For the distinction between scarlatina and erythema scarlatiniforme the paragraphs devoted to a description of the malady last named may be consulted.

Great care should be taken not to confound the drug-rashes having a scarlatiniform appearance with the specific disease under consideration. Thus, belladonna, in doses of 1 minim of the tincture every hour to the extent of four doses, has produced an abundant scarlatiniform eruption in children, a diagnostic point of importance in view of the fact that the drug named has been employed as a prophylactic against the disease. For eruptions of this sort due to quinine and other drugs the reader is referred to the pages devoted to *Dermatitis medicamentosa*.

Treatment.—The modern treatment of uncomplicated scarlatina is antiseptic and expectant, after provision is made for an abundant supply of fresh air, disinfection, a proper regulation of food and

¹ Virchow's Archiv, 1905, clxxix, p. 485.

drink, and the local use of baths, tepid or cool, for the purpose of reducing the body temperature. After these baths the skin should be anointed freely with a fatty substance, such as cold-cream salve, scented almond- or olive-oil, or with vaselin. These inunctions are not only grateful to the patient, but they also reduce the body-temperature to a slight degree. All treatment other than that suggested above pertains to the field of general medicine, and should be limited to the special conditions presented in each case. Such treatment includes the management of disorders of the eye, ear, throat, kidneys, and other viscera, the involvement of which constitutes a complication of the disease.

Prognosis.—The prognosis of the malady should always be established with reserve. It is largely based upon the relative intensity of the symptoms, the vigor and age of the subject, and the presence or the absence of serious complications. Albuminuria is rarely absent, and is not *per se* alarming; but anasarca and other evidences of profound interference with the renal function are to be assigned due weight. In general, it may be said that a high range of temperature; early and ulcerative throat-lesions; the puerperal state; tardy development, rapid and untimely disappearance, or undue prolongation of the exanthem; and its admixture with petechiæ to such an extent as to indicate extensive hemorrhagic extravasation, are all formidable symptoms. Finally, it must not be forgotten that the mildest and simplest forms of the disease, after the fastigium is passed and convalescence is actually established, may terminate fatally by the supervention of uræmia, cerebral paralysis, or even meningitis, consequent upon secondary changes in the middle or internal ear.

VARIOLA.

(Lat., *varus*, a blotch.)

(SMALL-POX, THE POCKS. *Ger.*, BLÄTTERN, POCKEN; *Fr.*, PETITE VÉROLE; *Ital.*, VAJUOLO.)

The variations of variola as to the severity, character, and duration of its symptoms are so great as to preclude complete description of this malady within the limits here assigned. The following paragraphs are therefore devoted to a sketch merely of its more commonly recognized characters.

Initial Rashes (*Variolous Erythema*; *Variolous Roseola*).—These may be either (a) erythematous in character, and general or partial; or (b) hemorrhagic, in the form of pure petechiæ or of admixtures of petechial and erythematous blotches.

On the second and third days there appears, in some cases, especially in menstruating women and in young subjects, a cutaneous efflorescence, the significance of which may be misinterpreted, thus leading to errors in diagnosis. To Hebra we are indebted for its distinct recognition as a cutaneous prodrome in variola. The interpreta-

PLATE XII



Variola, eighth day of eruption. (Heman Spalding.)

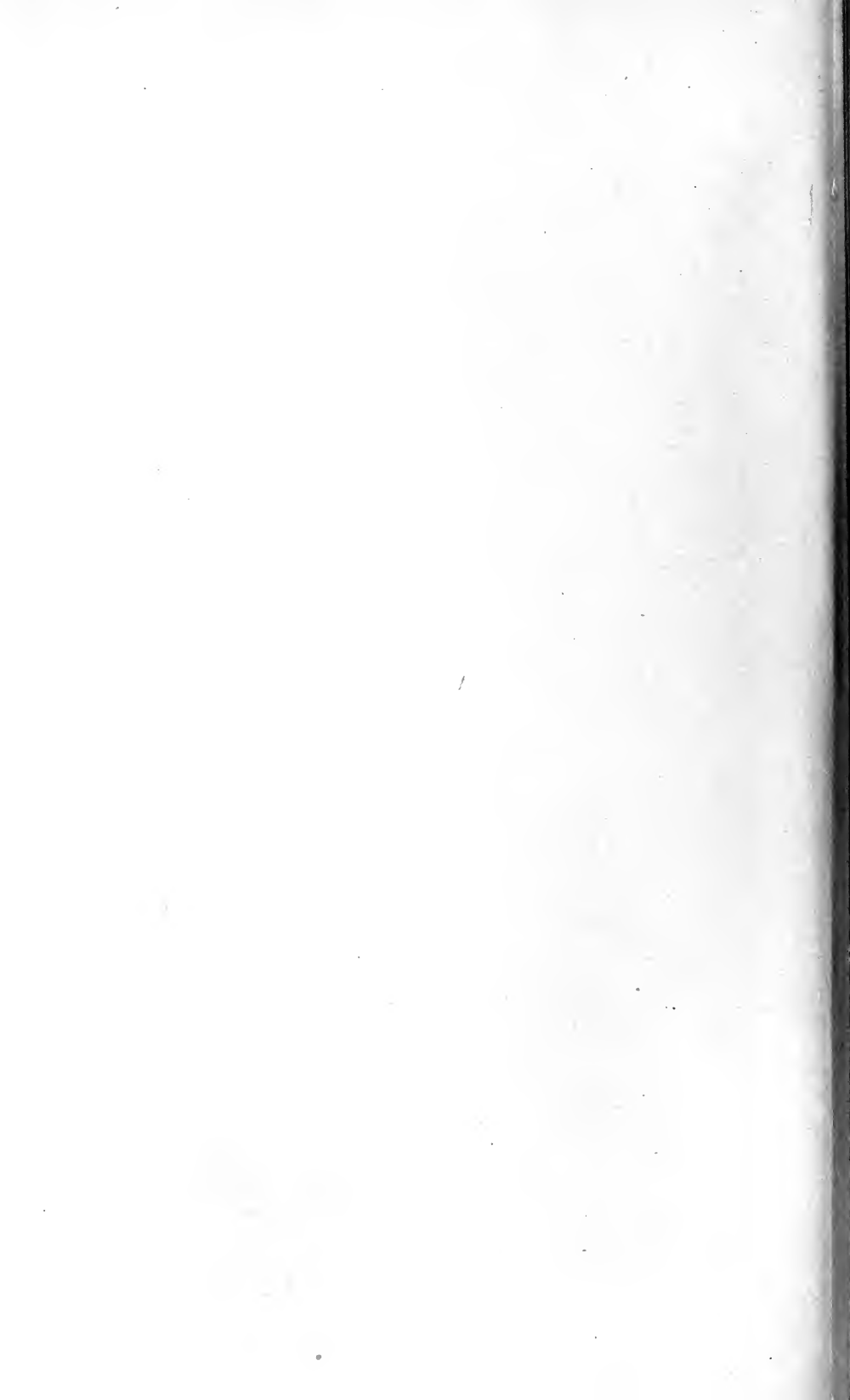




PLATE XIII



Variola, eighth day of eruption. (Heman Spalding.)

tion of this exanthem is a matter of special importance to the diagnostician, as many have been deceived respecting its nature and significance. It is characterized by the occurrence of irregularly disposed and distinctly outlined maculations, puncta, striæ, streaks, or a diffuse blush of bright or lurid reddish hue; the invaded integument being at times slightly tumid, and thus elevated above the general level. The affected part may also be the seat of moderate pruritus. The blush may fade under pressure, but rarely does so perfectly. One cannot by the finger produce upon it a visible whitish spot. The rash may be diffused widely but occurs most often about the groins, the hypogastric region, the pubes, and the inner faces of the thighs; and on examining these parts the physician will usually discover the evidence, in adult women, of recent or present menstruation, or of the puerperal state. It occurs also about the axillæ, the extensor faces of the larger and smaller joints, and the lumbar and clavicular regions. Often a broad area of the integument in these parts may exhibit a sheet or mask of dull crimson erythema, upon which may form pin-head- to bean-sized, dull-reddish papules, not losing their color under pressure, or more rarely petechiæ, vesicles, and wheals. All these are precursory phenomena, and are not transformed into characteristic variolous lesions. They fade almost completely before the latter appear. Rarely, a few scattered papules may be distinguished upon the face and the arms before the variolous erythema fades. Often the papules in full development are even less profusely displayed on the site of the precedent efflorescence. The latter need not be necessarily regarded as a symptom of portentous gravity. The entire surface of the belly may be covered with a uniform erythematous blush of dull-crimson hue, followed by confluent variola, and the patient ultimately recover. The physician, then, confronted with a deep-red erythema of the regions named, especially of the groins, the lower part of the belly, and the thighs of a menstruating woman affected with high fever, nausea, vomiting, and lumbar pain, should invariably suspect the presence of variola.

The vividly red or empurpled rashes of hemorrhagic type occur most frequently in the localities named above when the disease assumes a grave aspect, as in hemorrhagic variola.

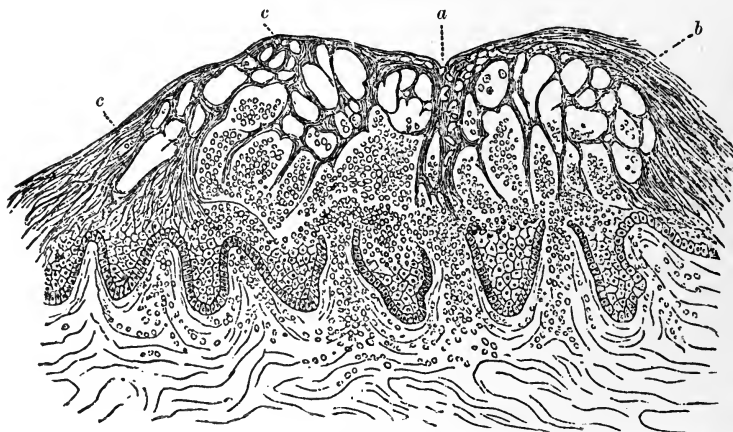
Small-pox Eruption.¹—The period of the eruption in variola is characterized, at its earliest, by punctiform, subcutaneous discolorations which photography alone can reveal. Commonly the patient will be seen on the morning of the third or oftener the fourth day with the face and scalp covered with pin-head-sized and larger, firm conical papules, the touch of which to the finger suggests to most English observers the feeling of shot embedded within the skin. Later, these papules develop upon the trunk and limbs; and in well-marked cases every portion of the body-surface is invaded, including the palms and soles. The lesions may be surrounded by a narrow

¹ Cf. Discussion on small-pox before Amer. Derm. Assoc., May, 1901, J. C. D., 1901, xix., p. 484.

rosy areola upon the trunk. They may be unproductive of subjective sensations or be slightly tender.

As a rule, there is complete defervescence when the exanthem appears, the patient experiencing such relief that if an adult has chanced not to view his face in a mirror nor to be informed of his appearance by those in attendance upon him, he often will regard himself as completely relieved of his three days' illness. In other cases the febrile symptoms persist with a lowered temperature.

FIG. 70.



Vertical section of pustule at the beginning of pustulation: *a*, umbilication at the site of an excretory canal; *b*, reticulum within the epidermis; *c*, reticulum of smaller meshes containing lymph- and pus-globules. (After RINDFLEISCH.)

During the first two days of the eruptive period the papules increase in number and become correspondingly agglomerated; while those of earliest appearance become transformed into vesicles containing a translucent serum, the roof-wall of many of them exhibiting an umbilication. This umbilication of the vesicle, though not invariably present, is characteristic, and slightly different from that observed in bullous and pustular lesions. The central depression is disproportionately large, and about it the yet undistended epidermis is often irregularly puckered or fluted. Even in this period the lapse of a few hours will produce a lactescent appearance in the formerly translucent contents. The mucous surfaces adjacent to the skin may similarly be involved.

From the sixth to the twelfth day the transformation of these lesions into pustules is effected, the process beginning, as in all the metamorphoses of the disease, in the vesicles of greatest age, those, namely on the face and upper portions of the body. The lesions simultaneously enlarge until they are of the size of an average pea, are surrounded with a distinctly ovoid areola, and, when fully distended, rupture the centrally placed filament which holds down the roof-wall; consequently the umbilication of the pustules is lost. The integument upon which they develop becomes visibly tumid. With

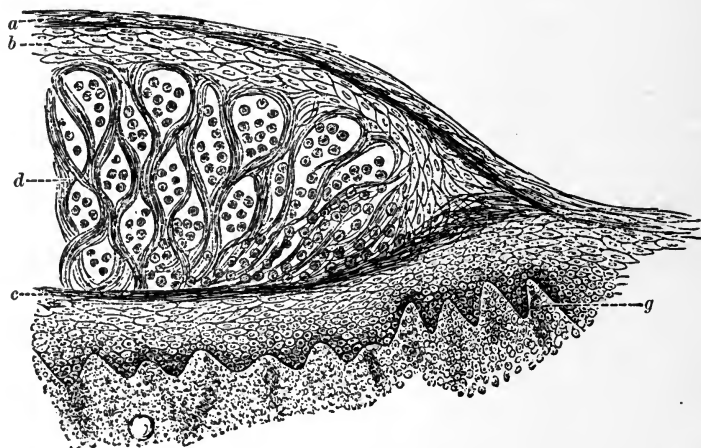
this process of suppuration is awakened the so-called "secondary fever," a pathological feature evidently not essential to the disease, as it does not occur in mitigated cases. This secondary fever is born of the extensive suppuration occurring in the skin and other organs, and may be symptomatic, sympathetic, or septicæmic in character. It thus varies in different cases with the character and severity of the process by which it is excited, being transitory in mild cases, and in others terminating only with death. At this time the patient is usually in a most distressing condition. The skin of the face and of other attacked regions is swollen, thickly covered with pustules, and the features indistinguishable in the tumid and closed lids, the œdematous lips, disfigured nostrils, and pus-obstructed mucous outlets. Deglutition becomes painful and often impossible, the saliva flows from the lips, and the mucus from the nares dries with the pus upon the exterior of the visage. The pustules recognized upon the integument are represented also in the gastro-intestinal tract. In an autopsy of a patient dead at this stage of the disease the entire canal from the mouth to the anus, as also the genito-urinary and respiratory passages, may be completely covered with closely agglomerated and well-distended pustules. The career of those within the mouth can usually be studied by eye-observation. In this situation they rapidly lose their epithelial roof-wall by reason of the heat, moisture, and friction to which they are subjected, and then exhibit a reddened and excoriated surface, over which there is re-formation of the epidermal layer. Gangrenous complications are rare. In this condition women who are pregnant frequently abort or miscarry, the foetus coming into the world exhibiting cutaneous symptoms of the disease.

Between the thirteenth and fourteenth day desiccation begins, and is usually completed within from ten days to a fortnight; the pustules rupture, and the exuded pus concretes into yellowish or brownish, rarely blackish crusts, or the latter are formed by the desiccation of the entire envelope and contents. The pulse usually at the same time diminishes in frequency and secondary defervescence occurs, the tumefaction of the integument decreases, and at times the peculiarly characteristic and often intolerably fetid odor from the patient is less perceptibly exhaled. In from four to six weeks the course of the disease is completed. The immediate traces of the eruption are purplish and violaceous pigmentations, which slowly disappear. When cicatrices result they are slightly depressed, at first of a dull purplish hue, later dead-white, lustrous, usually symmetrical in disposition; and most distinct upon the surfaces exposed to the light and air, such as the face. Though persistent, they are rendered somewhat less deforming in the progress of years. When closely set together they produce a characteristic ridged and corded appearance, due to the elevation of narrow bands of unaffected integument between the depressed surfaces of scars. The several departures from the pronounced type of the disease described

above present variations differing widely from the most benignant forms. Brief reference only can be made to these variations.

Varioloid.—Varioloid, whether occurring after vaccination or not, is a modified type of variola. With it should be classed all those forms of the disorder occurring in the human subject, and described by authors under the titles "wart-pox," "horn-pox," variola siliquosa, miliaris, verrucosa, crystallina, cornea, etc. In these cases there may be a severe prodromic fever and a scantily developed exanthem; rapid involution of lesions; abortion of the latter in any of their several stages from papule to crust; absence of secondary fever; transmission of the disease in a mild or mitigated form from one individual to another, so that an entire community, vaccinated and unvaccinated alike, may suffer from an epidemic disorder of this moderate

FIG. 71.



Vertical section of one-half of an undeveloped variola-pustule: *a*, old epidermis; *b*, epithella of rete above the alveoli; *c*, new-formed epidermis; *d*, alveoli filled with pus-globules; *g*, flattened and infiltrated papillae lying beneath the pustule. (After AUSPITZ and BASCH.)

grade without the occurrence among them of a single case of typical variola. It is scarcely necessary to add that a patient with varioloid, especially during an epidemic, may transmit to the unprotected a malignant form of the disease.¹

Hemorrhagic Variola (*Black Small-pox, Variola Nigra Maligna*), fortunately rare and confounded in the past with "black measles," is a formidable condition, viewed from any point.

The disease is developed in two fairly distinct types: the one purpuric, most often seen in subjects debilitated by alcoholism, by enfeebling maladies in infants, and by the puerperal state in women; the other shows pustular lesions.

When cutaneous hemorrhages occur during the course of small-

¹ For a consideration of the symptoms and diagnosis of modified small-pox as it has appeared in recent epidemics, see Welch, Phila. Med. Jour., 1899, iv., p. 973, and paper by me published by Illinois State Board of Health, 1900.



PLATE XIV



Variola, sixth day of eruption. (Heman Spalding.)

pox they do not necessarily indicate that the case is one of so-called varioliform purpura, since these extravasations may be accidents of the pathological process. In this malignant form of the disease, against the ravages of which vaccination often presents but a feeble barrier, the prodromic stage is followed by a deep purplish redness of the surface which is characterized by pin-head- to split-pea-sized, firm, closely set papular lesions, suggesting the occurrence of measles in a peculiarly severe form. The febrile, nervous, and other symptoms of the disease are proportionately intense. Ecchymoses appear upon the conjunctival membrane. Gradually the color of the exanthem, that at first disappeared under pressure, refuses thus to yield and assumes a bluish-black shade. Ecchymotic patches may be intermingled with the papules, rapidly widening to palm-sized and larger areas. The mucous surfaces share in these colors, being also infiltrated with effused blood, and the muco-cutaneous orifices are crust-covered and exhale an extreme fetor. Blood may escape from the bowels, bladder, mouth, or vagina. Signs of grave systemic and visceral complications are always present. Vesiculation, pustulation, and the typical transformations of variolous lesions may be present, the blood in most cases becoming extravasated at the base or border of the lesions interspersed with petechiæ. In the few cases observed by us death speedily supervened, either from shock, coma, hemorrhagic infarction of the lungs, or rapid exhaustion. Intermediate forms between hemorrhagic and true variola are described, in which forms the pustules occurring in the variolous type of the disease merely fill with blood in consequence of accidents possessing a purely local significance.

Confluent Variola.—Confluent variola is another severe form, less malignant, however, than that just described. It is characterized by intensity of the prodromic fever, which often scarcely abates with the appearance of the exanthem. The latter is developed in deeply implanted, firm papules, closely set together, succeeded by vesicles and pustules, which, as they enlarge, fully occupy the entire surface of the integument, and accomplish a perfect coalescence. In well-marked cases there is scarcely a pinhead-sized area of the entire surface of the body that is not invaded. The tissues become enormously œdematous; the deformity of the face renders the features indistinguishable. Hemorrhagic pustules and even patches of a gangrenous pulp may be intermingled with sheets of suppurating surface. Phonation, respiration, and deglutition are impeded proportionately or are subverted absolutely by the tumefaction and supuration of the mucous membranes of the respiratory and gastrointestinal tracts. When the patient survives until the stage of desiccation is reached, the body presents a revolting aspect. A thick brownish or blackish-brown mask envelops the swollen head, trunk, and limbs, and the odor exhaled from the body is intolerably repulsive. All the systemic phenomena are proportionately grave, and are accompanied by one or more of the complications of the malady—

pneumonia, pleuro-pneumonia, albuminuria, diarrhoea, various motor and sensory paralyses, furuncles, and subcutaneous abscesses. The eyes may suffer from pustular and ulcerative changes in the conjunctiva, cornea, and deeper tissues, with resulting inflammation of every grade to panophthalmia and consequent loss of vision. Often the patients, with surprising powers of resistance, will survive until extensive sheets of crusts have fallen from the skin-surface, and then perish slowly in a typhoid condition with low remittent or continuous fever. Every such case does not, however, terminate fatally. Both adults and children may rally from the severest form of confluent variola, and afterward enjoy vigorous health.

Symptoms.—The period of incubation of the unmitigated disease varies between five and twenty or more days, occupying usually twelve days or a fortnight. It is characterized by the peculiarities of that period recognized in all the exanthemata, there being few and insignificant or no evidences of physical discomfort. The prodromic stage is ushered in generally by a vespertine chill, succeeded by fever, with a temperature rising to 104° – 106° F., which is commonly associated with severe and characteristic pain in the loins, headache, epigastric pain, nausea or vomiting, and occasionally in young subjects with delirium and convulsions. The fever continues, with alternations of exacerbations and partial relief, or sensations of chilliness, during the second and third days. At the same time there may be faucial hyperæmia and moderate dysphagia. Occasionally, before the cutaneous exanthem appears, minute reddish papules may be recognized upon the buccal membrane.

Etiology.—Variola is always the result of mediate or immediate contagion. It is a disease both contagious and infectious, being often epidemic and transmissible by volatile emanations from the victims of the disease. It is also artificially inoculable. When transmitted by the latter process its period of incubation is somewhat shortened, and often its successive manifestations become less formidable. The history of inoculated human variola has received, however, but little attention during late years, since the practice properly has been forbidden by law. The disease is, to a certain extent, transmissible from man to the lower animals, and the reverse. It attacks individuals of both sexes and all ages, including the fœtus *in utero*, which may be ushered at an untimely hour into the world, macerated, or recently dead, and covered with the lesions of variola. The disease in the larger cities is decidedly more frequent in winter than in summer, possibly because in the colder months the opportunities are greater for spread of the contagion in artificially heated dwellings in which numbers of individuals are crowded together. Islanders, long unvisited by an epidemic and unprotected by vaccination, may suffer equally in the summer season.

Pathology.—The latest investigations on the pathology of variola

PLATE XV



Variola, tenth day of eruption. (Heman Spalding.)



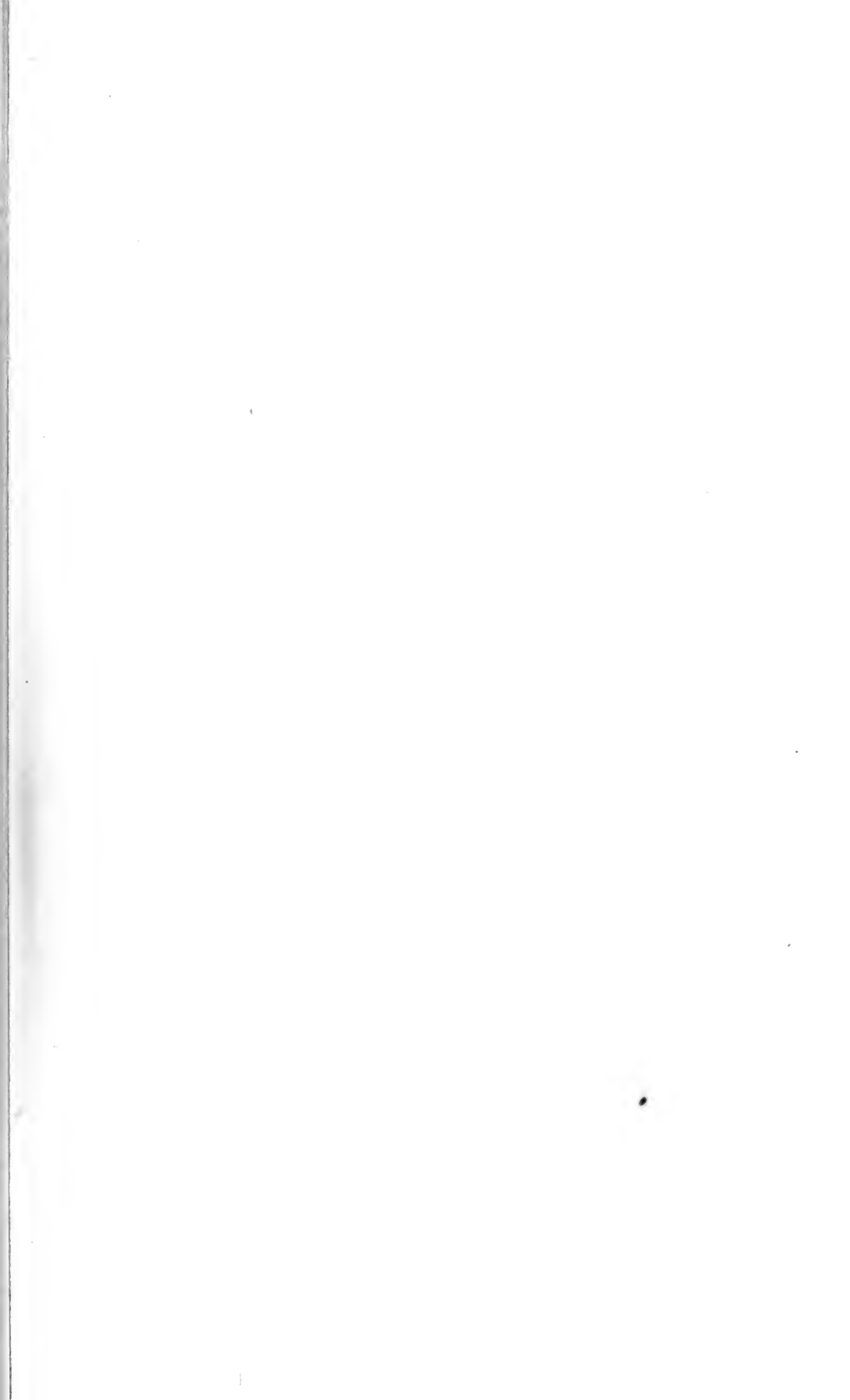


PLATE XVI



Variola, thirtieth day of eruption. (Heman Spalding.)

have been made by Councilman, Magrath, and Brinckerhoff.¹ These observers believe that the peculiar inclusions within the epithelial cells, previously described by Guarnieri in 1892, and after him by others, sustain relations to the etiology of the disease.

In the lower layers of the epithelia structureless bodies are seen from 1 to 4 μ in diameter, lying in the intercellular vacuoles which at first are scarcely larger than the contained bodies. The vacuole, however, increases in size as these bodies become larger, more definitely granular, and more distinctly located. Segmentation of the mass occurs later with the formation of round bodies about 1 μ in diameter. These intercellular bodies are regarded as living organisms.

When segmentation is completed, small, round, oval, or ring-like bodies appear in the nucleus which increase in size, acquire a definite structure, and consist of a series of vacuoles around a large central vacuole, one or more appearing at times within a single nucleus.

The intranuclear body is believed to be an advanced stage of the development of the intracellular body, springing from the spore-like elements produced by segmentation of the intracellular body, which pass into the nucleus. The spores formed by its segmentation are probably the "true infecting material of variola." Inoculation of rabbits with the contents of variola-pustules has given origin to lesions in which both the intracellular and the intranuclear organisms have been recognized. It is believed by these observers that in small-pox the parasite passes through two cycles, but that in vaccinia the primary cycle alone is traversed. The spore-like body formed in this cycle, when introduced into an unprotected human subject, produces vaccinia.

Coze, Feltz, Baudouin, Luginbühl, Weigert, Hallier, and Cohn recognized both bacteria and micrococci, in the blood of variolous patients. Cohn² regards these parasites as instances of a "twin race" of *Micrococcus vaccinae* discovered in vaccine-lymph. The secondary fever of the disease is without question septicæmic, and is due to pus-cocci and their toxins.

According to Unna, the main distinction between the vesicle of varicella and that of variola lies in the slow growth of the one and the prompt suppuration which is added to the fibrinoid degeneration of the other. The epithelium of the lower prickle-layer undergoes speedily "ballooning colliquation" not only at the apices of the papillæ, but also in the depths of the ridges. A gradual division of the vesicle follows into an upper and a lower story, with a lateral extension of the cavity in the upper prickle-layer, a somewhat characteristic œdema, and mitotic proliferation of the semisolid cushion below. The umbilication is produced less by the action of centrally placed

¹ Jour. Med. Resch., May, 1903, ix., p. 372. See also Funk, B. M. J., 1901, i., p. 448 (abstr. in Archiv, 1903, lxx., p. 290); Stokes, Bull. Johns Hopkins Hosp., 1903, xiv., p. 214; Sanfelice and Malats, Archiv, 1902, lxii., p. 189; Thompson, Jour. Med. Resch., 1903, x., p. 71.

² See Magnan, loc. cit., p. 411.

epithelia acting as guy-ropes than by the enormous force of the exudation at the periphery in contrast with the slight activity of the central parts, as a result of which the latter are simply "left behind." Gradually there follows a dense collection of plasma-cells in the adventitial sheaths of the blood-vessels. The latter subsequently dilate, and the line of demarcation between the cutis and rete becomes well-nigh indistinguishable on account of the stream of leucocytes thither. Healing begins at a later stage by the formation and gradual contraction of a thin layer of epithelial cells lying close to the connective tissue and extending from all sides beneath the pustule.

Diagnosis.—The difficulty attending the diagnosis of variola in its prodromic and earliest eruptive stages, from measles, is considered in the description of the latter disease. The general demand, indeed, upon the physician for an exact and definite diagnosis of every case before its complete evolution, is founded upon an erroneous conception of possibilities, and the sooner this generally is recognized the better. A delay of even a few hours will often verify or remove a suspicion. Fully as much mortification on the part of the physician and damage to the best interests of the patient may result from an error in one direction as in the other. The wisest course in every doubtful case is to admit the doubt and to visit the patient frequently for the purpose of observing the development of the disease until that doubt is removed. Typical cases of variola are recognized with ease from the character of the symptoms presented. Measles and scarlatina resemble variola only during the period in the last-named disease when the variolous rashes are present. The symptoms of diagnostic importance at this period are, the presence or absence of fever, of catarrhal symptoms, of lumbar pain, the site of first appearance of lesions, and the duration of the disease. Impetigo, and, in particular, impetigo contagiosa, is a non-febrile, almost never generalized, affection of the face and hands—in point of fact a finger-nail-filth disease. Its particular lesions are relatively few, and not umbilicated. Varicella (chicken-pox) is characterized by the occurrence of the thin-walled, translucent, superficially situated vesicles first developing on the trunk, later on the face, with a mild fever accompanying instead of preceding the rash. They are never indurated nor umbilicated. Accidental and secondary eruptions which may be present are recognized by the history and features of each.¹ Syphilis and acne are always distinguished by the absence of fever and their relative chronicity.

Treatment.—The treatment of variola should, in general, be limited to the indications presented in each case. No remedies can be employed which have the least power to abort the disease. Kaposi calls attention to the striking fact in this connection, that syphilis, for many of the manifestations of which mercury is a specific, is a disease the second incubation-period of which is measured by weeks, and yet neither by excision of its initial sclerosis nor by mercurials

¹ Schamberg, J. C. D., 1903, xxi., p. 215.

can the subsequent manifestations of the disease be completely prevented. Certainly no specifics are recognized as of value in variola. The patient should be kept in a relatively dark room with an abundant supply of fresh air of a uniform temperature, and antiseptic solutions should constantly be at hand into which all the ejecta are received immediately. He should be given ice when this is acceptable to the palate, cool water *ad libitum*, and his strength should sedulously be supported by a liquid animal diet. The body may be sponged with or bathed in cool or tepid water as often as is grateful to the patient. In severe or confluent cases the immersion of the body in the continuous warm water-bath is followed by brilliant results in hastening the desiccation and fall of the crusts and subsequent repair. A bath of this character given for merely two or three hours in the day is often of great value. With and without these external measures gargles of potassium chlorate, myrrh, honey, or carbolic acid will be found acceptable to the mouth and palate. The constant attention of an efficient nurse bestowing assiduous care upon the mouth, the skin, and the eyes may be regarded as an essential part of all sound treatment.

With a view to the prevention of pitting, no measures of a therapeutic character will prevent the occurrence of a distinct cicatrix whenever pus has eroded or otherwise destroyed the integrity of the papillary layer of the corium. Every effort, therefore, should be exerted to prevent extension of the suppurative process to the true skin. The following measures have approved themselves as of practical value: First, the sick-room should be moderately darkened and yet be amply provided with fresh air. Second, a solution of pure sodium hyposulphite should be administered night and day in the dose of from 15 to 20 grains (1.-1.3) every three or four hours. Salol,¹ iron, strychnine, quinine, digitalis, and opium, are indicated at times. The variolous lesions pursue a milder course under this internal treatment, and in some cases even the vesicles shrivel before pustulation is fairly begun. Third, the skin of the face, after sponging with a weak formalin lotion, should be anointed with a bland fatty substance such as vaselin, almond-oil, or fresh lard, and over the unguent may be laid silk-enveloped compresses, dipped in tepid weak solutions of carbolic or boric acid, or of thymol. The unguents thus employed are medicated at times with boric or carbolic acid, zinc oxide, resorcin, bismuth, sulphur, or other ingredients. The anointing of the surface before the application of the lotion is commonly more grateful to the patient, but the skin may be moistened with the aqueous lotion alone. Here, again, the assiduous attention of the nurse is a matter of importance. The powder of eucrophen topically is applied often with advantage.

The edges of the eyelids should daily be anointed with freshly prepared cold-cream salve. Puncture of the cornea may be required

¹ Begg, Scot. Med. and Surg. Jour., 1900, p. 222 (abstr. in B. J. D., 1900, xii, p. 184).

for the relief of hypopyon. Diarrhœa and other symptoms of visceral derangement should be relieved by appropriate medication. As a rule, the administration of narcotics for the relief of pain is objectionable. Throughout the course of the disease the strength of the sufferer should be supported by a generous use of animal broths or of milk; in typhoid conditions a judicious employment of stimulants may be necessary.

The red-light treatment of small-pox devised by Finsen has been tried in a considerable number of cases with excellent results.¹ In America the method has received little attention. A few observers have reported failure with the treatment, but in these instances it is not clear that the technique was carried out properly.

The treatment is based on the principle of excluding the chemically active rays from the skin of the affected patient. For this purpose the subject is placed in a room to which no light is admitted that is not first filtered through red glass or other material that will effectively shut out all the chemical rays. As a control-test, sensitized photographic plates are hung in the room, and if they at any time show the influence of white light the technique is not perfect. Finsen states that "when the patient comes under treatment early enough, before the fourth or fifth day of the disease, suppuration of the vesicles—even in unvaccinated persons and in cases of confluent small-pox—will be avoided, with one exception out of about seventy. . . . Should the patient come under treatment after the fifth day of the disease, it is uncertain whether suppuration can be avoided."

This method apparently has prevented suppuration, secondary fever, and scarring, in more than 100 cases, and is certainly worthy of thorough trial.

Prognosis.—The prognosis of variola is largely dependent upon the degree of protection conferred by previous vaccination. Independent of vaccination, the age and vigor of the patient, the presence or absence of an epidemic of severe or mild type, the extent of the eruption, and the character of the surroundings of the patient are elements of prime importance. Very young and aged subjects, women pregnant or in the puerperal state, and, as Hebra has shown, those who have suffered from a previous attack of the same disorder, are all unfavorably disposed with respect to the final result. Confluent and hemorrhagic forms of the disease are, naturally, the gravest. Unmitigated variola, under the most favorable circumstances, is one of the greatest scourges of humanity, and as such will probably always destroy a frightful proportion of its victims. At

¹ Phototherapy, translated from the German by J. H. Sequeira, London, 1901. Brown, Brit. Med. Jour., 1903, ii., p. 1409; Naunyn, Unterelsässischer Arztverein, Sitz. 26 Juni, 1903 (abstr. in Münch. med. Wehnschrft., 1903, l., p. 1360); Depray, Jour. méd. de Bruxelles, 1903, viii., p. 69; Emmerson, Med. Times and Hosp. Gaz., 1903, xxxi., p. 419; Carassa, Il Morgagni, i., No. 4 (abstr. in Monatshefte, 1903, xxxvi., p. 336); Münch. med. Wehnschrft., 1903, l., p. 1810.

the same time the conscientious physician needs to be impressed with the fact that, under the most discouraging circumstances, the patient, disfigured to the greatest extent by an envelope of blackened crust, and in a state of extreme physical prostration, with many of his bodily functions almost completely suspended, may even from the midst of such peril be won back to life and vigor. The assiduous attentions of a skilful nurse, guided by the inspiring presence and councils of a physician who is himself fearless of the malady, will often achieve the result. Upon the latter point it is interesting to note that physicians in active practice who do not hesitate to expose themselves freely to the disease in the discharge of the duties of their profession, rarely suffer in their own persons.

VARICELLA.

(CHICKEN-POX. *Ger.*, SPITZBLATTEN, WASSERPOCKEN;
Fr., VARIOLETTE; *Ital.*, MOROIGLIONE.)

Symptoms.—After an incubative period lasting from ten days to a fortnight the first manifestations of the disease appear. This may be a prodromal erythema of which Anthony¹ has reported two cases. This eruption is the first evidence of disease; it appears suddenly, is generalized, and resembles scarlet fever but is less punctate, although usually it is quite distinct. The patient has watery eyes as in measles, a symptom never seen in scarlet fever. In some cases where the patient is stripped one or several umbilicated varicella vesicles may be found on the body. The temperature is quite high (104° F.), still the patient does not impress one as being seriously ill. Both the erythema and the temperature disappear in from twenty-four to forty-eight hours and the patient is found to exhibit the typical varicella eruption. The patients are usually children, who may suffer from fever of a moderate grade (99°–100° F.), lasting from a few hours to two or three days, after which defervescence is commonly complete. With the onset of the fever or even without, the rash appears, first on the head and trunk, in the form of rosy macules or slightly elevated lesions lacking the characteristic “shot-like” feeling of the variolous papule. These macules rapidly become vesicular, the lesions being pin-head- to pea-sized, rounded or oval, well-projected from the surface, limpid, superficial in situation, differently shaped from variolous lesions, and almost never umbilicated, puckered, or “fluted” as in small-pox. The macules appear in successive crops, often first over the upper posterior aspect of the trunk, where the typical evolution of the disease is best studied, and then the elements of the eruption are surrounded often by a faint pinkish or reddish halo. Their contents become cloudy or lactescent rather than puriform, and they desiccate as early as the second day, forming thin, light, superficial crusts. The lesions may be abundant

¹ J. C. D., 1906, xxiv., p. 68.

in one region, as, for example, over the back or the chest, but are never both abundant and generalized and are invariably discrete, never confluent. They rarely occupy the palms and soles; and the vesicular lesions may develop as such, or spring from the macules, the latter, however, not invariably going on to vesiculation. They may occur in crops or simultaneously involve several regions of the surface of the body. They may develop after typical variola.¹ Like variolous lesions, they extend at times to the mucous surfaces of the eyes, the mouth, and the genital regions. Occasionally they are productive of pruritic sensations. Often the course of the disease is so mild and the exanthem so slight as scarcely to attract attention. Cicatrices result only in places, chiefly the face, where the lesions have been subjected to local irritation.

Etiology.—The disease is infectious, and if inoculable such a result rarely is obtained. In the large majority of all cases it is a disease of infants and children; and though an enormous experience of authors is cited to the contrary, we have observed it in a few instances in adults, and even still more rarely in advanced years. Second attacks may occur, but are infrequent. The source of the disease is invariably an infected subject.

Diagnosis.—The doctrine that varicella is a mitigated form of variola has been practically abandoned in consequence of the researches of pathologists. It is of vast importance that the essential differences between the two diseases be exactly and generally recognized.

In variola the invasion-period of relatively fixed limits, the speedy transformation of the lesions into minute, firm papules, their early appearance on the exposed parts of the face and wrists, the age of the patient, the thermic variations, the prodromic rashes, and the rapid transformation of the papules into umbilicated vesicles, are all important diagnostic points. In varicella the trunk usually exhibits the greater number of lesions, which appear often in successive crops. Beside the characteristics of the cutaneous lesions the catarrhal symptoms of measles and the sore-throat of scarlatina will point to the nature of these disorders. Impetigo contagiosa is to be carefully distinguished from varicella, since the two affections occur at times side by side in one hospital ward, and occasionally the former succeeds the latter. The lesions of impetigo contagiosa are often larger, generally more persistent, and the crusts bulkier than in varicella, and the patients rarely exhibit pyrexie symptoms.

In those rare instances where varicella appears in later adult life, an immediate differentiation from variola may be difficult or impossible. Especially is this true when in such an one the varicella is complicated by a coincident attack of herpes zoster frontalis, an event which we have observed in one case.

Pathology.—According to Unna, the varicellous process begins with a "reticulating liquefaction" of some of the prickle-cells of the

¹ Schamberg, Phila. Med. Jour., 1902, ix., p. 442.

central and upper portion of the rete in which the first congestive focus is seen. The complete liquefaction of the contents of the loculus is followed by confluence of adjacent cavities and rapid dilatation to the point of formation of a vesicle, the non-liquefied and persistent epithelium being compressed so as to form the septa, while the cells above produce similarly the roof-wall. The epithelial cells of the base undergo, on the other hand, "ballooning colliquation" (transformation of cells into hollow spheres or balloons having the form of peculiar giant-cells), a change affecting especially the centre of the pock, its lateral margins, and even at times its septa. Internally, these ballooned cells merge into simple oedematous epithelium with constricted nuclei. Careful observation of the lesions of varicella demonstrates that the vesicles are as distinctly divided into septa as are those of variola. These lesions are never monolocular. Their benign course is explained pathologically by their superficial position, by the absence of purulent infection, and by early repair with young epithelium. The absence of umbilication is explained by the acuity of the process. Bareggi, Guttmann, Pfeiffer, and others claim to have discovered micrococci and protozoa both in the blood-corpuscles and in serum obtained from subjects of the disease; but no pathogenic relation of these germs has been established.

Treatment.—The management of uncomplicated cases of varicella is limited to the avoidance of exposure to sources of aggravation of the affection. Often a dusting-powder may be applied over the surface after a lotion of thin oatmeal-water. Cases complicated by the accidents of exposure or by the intensity of the disease are to be treated by the resources of general medicine according to the indications presented.

VACCINIA.¹

(COW-POX. *Ger.*, KUHPOCKEN; *Fr.*, VACCINE.)

The limits of this volume forbid a discussion of the interesting questions concerning the relations of cow-pox as it occurs spontaneously in the milch cow, to human variola. A careful collation of the results obtained by a large number of vacciniculturists of recent days renders it clear that it is a matter of great difficulty to transmit variola from man to the heifer; that where this rare result is obtained the lymph derived from the lesions on the udder or the belly of the animal is liable to produce variola when retransmitted to man; and that spontaneous cow-pox seems fittest to furnish a lymph which is safely inoculable in generations to the human race.

Of greater importance is it to note that, either by arm-to-arm vaccination as was formerly extensively practised, or by the use of the animal virus which is now well-nigh exclusively employed, there has been conferred upon millions of human beings a degree of protection against variola the value of which is beyond estimate. In both

¹ Cf. Osler, *Modern Medicine*, Vol. ii., p. 316.

methods the lymph is originally derived from the female of the cow, preferably during the puerperal state, and its sources are the vesicular lesions of vaccinia spontaneously arising or artificially cultivated about the teats, udder, and adjacent parts. The introduction of this lymph into the skin of the human subject is termed "vaccination."

The operation of vaccination should eliminate to the largest extent the possibility of transmitting any other contagious disease than the one intended. With this object in view, no better instrument can be devised than a clean needle, one which has been properly disinfected and not previously employed for any purpose. The skin of the part selected for vaccination being first cleansed antiseptically and subjected to slight tension by the left hand, the vaccinator should scratch or scrape off the epidermis with the needle, held in the right hand, by a series of parallel and crossed strokes, so as to make three or four superficial erosions three inches or more apart. Each of these multiplex wounds should have the size of the nail of the little finger, and should in no case bleed, but merely ooze with serum slightly tinged with blood. At such points the lymph, preferably extruded by air-pressure from a slender glass tube in which it has hermetically been sealed, is to be rubbed in slowly and thoroughly.

Between the third and the fourth day after a successful vaccination of the unprotected a light-reddish, pin-head-sized maculo-papule rises at each inoculated point. Between the fifth and the sixth day it becomes transformed into a translucent, well-distended, occasionally umbilicated vesicle, which, when single, may attain the size of a finger-nail. Springing from the multiplex abrasions described above, a minute papule usually forms at each point of intersection of the crossed lines produced by the scratching with the needle, and the subsequent vesicles coalesce, thus forming by the sixth day a compound lesion of rather peculiar aspect. It appears often as a small-coinsized plaque, elevated to the extent of a line or more beyond the general level of the skin-surface, with a rim formed of numerous discrete or confluent vesicles, which in either case are closely set together. The compound plaque seems to develop afterward as a single lesion, its centre being depressed. After the ninth day the fluid becomes opalescent, and desiccates in a reddish-brown crust, which, examined in section in a good light after it is completely dried, exhibits a smooth, homogeneous, shining appearance with a color having the shade of amber. The base of the lesion, single or compound, is usually very distinctly indurated.

Fully as important as any of the metamorphoses of this lesion is its rosy-red areola, in the absence of which it has been held that there is not proper protection. The areola, which endures from about the fifth to the tenth day, completely encircles the compound vesicle in the form of a halo having a diameter of several inches, the tissue it invades being often slightly tumid. When the pathological process in the focus of this areola is intensified, either as the result of the irri-

tant character of the virus or from extrinsic causes (undue exertion of the vaccinated part), the areola may spread down the arm or over the thigh or leg and eventually cover a dense, brawny, and deeply reddened integument. Dermatitis, erysipelas, lymphangitis, adenopathy, and severe grades of inflammation of the subcutaneous tissues may for similar reasons complicate the process, which may terminate by central sloughing, ulceration, slow repair, and the production of an atypical cicatrix. Ordinarily the subjective phenomena are limited to a mild or annoying itching of the vaccinated surface; in other cases severe burning pain, a feeling of tension, well-marked adenopathy of the lymphatic glands in the vicinity, and even sympathetic fever may be aroused.

The acme of a successful vaccination is usually attained between the tenth and the fourteenth day, after which the symptoms of the disorder gradually subside, the crust falling, if undisturbed, in the course of the ensuing week. When "animal" virus is employed the duration of each of these stages of the disease is usually somewhat prolonged.

The cicatrix, at first slightly reddened or pigmented, gradually assumes the dead-white appearance of scars in general. When typical it is slightly depressed, circular, not irregular nor deformed by ridges, cords, or bands, and "foveolated," exhibiting a series of peripheral pits or depressions, each of which represents the site of a former minute vesicle of simple type. The degree of protection is based in part upon the multiplicity of typical cicatrices.¹

The complications of vaccination are due: first, to the character of the virus employed; second, to the character of the soil in which it is implanted; and, third, to the external accidents to which the vaccine-lesion is subjected. Respecting the first of these sources, there are few contagious diseases beside syphilis which may be transmitted by vaccination. When this accident occurs it may be due either to syphilis in the vaccinifer or to the use of instruments soiled with infectious secretions. The lymph from a typical vaccine-vesicle upon the skin of an intensely syphilitic vaccinifer will necessarily transmit syphilis if accidentally it be commingled with either blood or the products of inflammation at the base of the pock. The stage and intensity of the disease in the vaccinifer are elements which cannot be ignored in forecasting the issue. The vaccine-lesion may complete its career during the incubative period of the initial sclerosis, the existence of which at the site of vaccination is commonly declared later by induration, ulceration, pigmentation, and axillary adenopathy. The occurrence of a generalized syphiloderm before the chancre of vaccination is completely healed may be the first symptom to arouse suspicion. The popular impression regarding the frequency of this accident is erroneous. The rarest of all modes of transmission of syphilis is that by vaccination. In all such cases the possibility

¹ Welch-Schamberg, "The Characteristics of Genuine Vaccinia," *St. Louis Med. and Surg. Jour.*, 1902, lxxxiii., p. 199.

that the syphilis may be hereditary and its symptoms simply coincident in point of time with those of vaccinia, should not be forgotten. It is possible that lepra and tuberculosis may thus be transmitted, but such accidents are exceedingly rare.

Exceedingly dangerous is that vaccine-virus, however good its early character, in which decomposition or putrefactive changes have occurred after exposure in a liquid form to the action of heat and the atmosphere. Vaccination with lymph thus changed has rapidly been followed by fatal results, in consequence of the supervention of pyæmia, septicæmia, or gangrene.

Complications of vaccinia, due to the character or predisposition of the tissues in which the virus is introduced by the vaccinator, are usually ascribed by the ignorant or the prejudiced to the causes just considered. *Post hoc ergo propter hoc* is the sole logic of the uninformed. In this way each of a series of maladies has been ascribed to "impurities" and "humors" introduced by vaccination. The arguments used in support of these assumptions are without basis in the most of cases. The cutaneous symptoms which may be awakened by vaccination are numerous. It will be remembered that the contents of the typical vaccine-vesicle are auto-inoculable, and that thus the scratching by young patients may produce an abundant crop of typical or torn vesicles upon the arms, legs, thighs, hands, and fingers. But vaccination may awaken in the patient, as explained above, a latent syphilis, as also a list of cutaneous disorders not contagious in character. Thus, an erythema (roseola vaccinia, vaccinola, etc.), eczema in many of its forms, and other exudative processes may be aroused first in the integument by the turbulence of a successful vaccination.

These rashes may become generalized,¹ and may even assume a formidable appearance. They may appear at any time from the second to the fourteenth day after vaccination. A scarlatiniform rash, diffused or in patches, is described by some authors as occurring in this way, accompanied by mild fever, and resembling German measles. Similarly generalized eruptions, resembling erythema multiforme, erythema scarlatiniforme, eczema, psoriasis, pemphigus, urticaria, impetigo contagiosa, varicella, and other cutaneous disorders, may appear for the first time within the limits named above. They usually disappear within a brief time after the vaccine-vesicle has completed its involution, and may be followed by slight desquamation or pigmentation. Very rarely vaccinia is followed by erysipelas, by purpuric symptoms, and by the development of lupus-nodules at the site of inoculation.

Vaccinia Hæmorrhagica.—This is a term descriptive of a complication of either the vesicle of vaccinia or of lesions surrounding the latter. In these cases there is hemorrhage into the vaccine-vesicle

¹ Burton, L., *Archiv*, 1903, lxx., p. 289; Piffard, J. C. D., 1899, xvii., p. 467; Morrow, B. J. D., 1901, xiii., p. 433; Freeman, *ibid.*, 1902, xiv., p. 186; Stelwagon, J. A. M. A., 1902, xxxix., p. 1291; Towle, *Boston Med. and Surg. Jour.*, 1902, cxlvii., p. 269; Heidingsfeld, J. C. D., 1902, xx., p. 67.

or the development of petechiæ in its neighborhood. As a result of uncleanness, not only may erysipelas be communicated as noted above, but septic infection, gangrene, tetanus, and other affections may originate at the site of a vaccine-vesicle.

Anomalies of the vaccine-vesicle occasionally are noted as to shape, career; and resulting cicatrix, which are difficult to explain. Thus, the papulo-vesicle may not exhibit an umbilicated centre, or may complete its course within unusually short limits; or a harmless ulceration may progress beneath its crust, requiring a week, or even more, for complete cicatrization. The so-called "raspberry-sore" results from coalescence of small papules, so as to form a pigmented tubercle. The scars resulting from many of these irregular and non-protective results of vaccination usually form atypical cicatrices, being, in one case, small palm-sized, deforming, corded, and representative of large tissue-loss; and, in another case, irregular and inconspicuous.

Lastly, the complications of vaccinia due to external accidents of the lesion are usually inflammatory in character. The excessive use of the vaccinated arm in labor and of the vaccinated leg in walking, standing, and other exertion, may induce, as indicated above, every grade of dermatitis and even ulcerative changes in the site of the inoculation, as a result of the intensity of the process. For these accidents rest is essential, with the free use of a dusting-powder over the inflamed surface. In exaggerated cases lotions of lead-water and opium may be employed. These conditions usually are relieved without difficulty as soon as the part is put to rest. The atypical scar which results seems to be in such cases as protective as others, if only the accident have occurred to a typically progressing lesion with distinctly perfect areola. Vaccine-cicatrices are to be distinguished in anomalous situations from maculæ atrophicæ, the scars of syphilis, and other scar-leaving disorders.

Bullous Dermatitis following Vaccination, at times with fatal results, occurring both in infants and adults, is a disorder of special importance. Cases of this type have been recorded by Bowen,¹ Howe,² and others. None of those reported by Bowen proved fatal. The bullæ appeared on the trunk in adults, though in children this region was spared; and were isolated or confluent, of different dimensions from that of a split pea to the size of small coin, often associated with œdema, purulent secretion from the parts invaded, and the formation of blackish crusts, the lesions in certain cases sparsely, in yet others abundantly distributed over the entire body surface. About five weeks after vaccination the exanthem appeared in the dangerous cases, those resulting fatally suffering from the usual complications of exhaustive disease. Some of the patients were unmistakable subjects of chronic alcoholism. The connection between the vaccination and the subsequent eruption is not definitely established. We have had two cases in children and two in adults. All eventually recovered.

¹ J. C. D., 1901, xix., p. 401.

² Ibid., June, 1903, xxi., p. 254.

Generalized Vaccinia.—Generalized vaccinia (vaccinal eruptive fever) usually results from a non-cutaneous introduction of vaccine virus; and is characterized by the production of vesicles of vaccinia in crops, which resemble strongly the lesions of variola. Supernumery vesicles form, at times on the mucous surfaces of the mouth, with febrile symptoms and subsidence of the eruption in about three weeks.

Pathology.—In the vaccine vesicle according to Unna, the epithelium undergoes ballooning as in variola and varicella, but in the first-named affection the two forms of degeneration, “reticulating colliquation” and “ballooning,” are peculiarly commingled. The greater prominence of the ballooning may be due in part to the juvenile character of even the oldest cells. The existence of an inoculation-wound has a marked influence on the microscopical picture, the resulting fissure being filled with blood-disks inside the horny layer, which is somewhat thickened. In vaccinia, as in the two maladies which pathologically it most resembles in its lesions, the formation of the vesicle is by chambers, the septa consisting of collections of cells (granular and others) which seem to be the remains of sweat-pores.

Micrococci have been recognized by Cohn in vaccine-lymph. These have been named “micrococci vaccinae,” but their relation to similar organisms discovered in the blood and tissues of variolous patients has not been determined. Wolff¹ claims to have cultivated these organisms through fifteen generations. Strauss demonstrated their existence in the vaccinal pustules of the calf.

Lipp, of Gratz, reported to the International Medical Congress, in London, that he had recognized great similarity, if not identity, between the micrococci of vaccinia and those of variola that he had cultivated to the second generation, but had then been unsuccessful in producing inoculation-effects. These organisms were always arranged in groups of four or multiples of four.

Steinhaus reports that Unna’s ballooning and reticular degenerations play no part in the formation of the pock in animals. The process is, instead, Ziegler’s dropsical degeneration with typical mitoses, but without division of the cell-nucleus.

Treatment.—The management of the severer types of vaccinia and of the complications of the disease is to be conducted in accordance with the principles of treatment described in connection with dermatitis venenata and acute eczema.

THE FOURTH DISEASE (DUKE’S DISEASE).

Duke described a disease which he believed belonged to the acute Exanthemata Group. The period of incubation was nine to twenty-one days, as in German measles. Prodromes were absent excepting malaise and slight sore throat in the early onset of the disease. The rash appeared rapidly and spread over the entire body in a few hours.

¹ Berlin. klin. Wehnschrft., January 22, 1883.

The color was brighter than in scarlet fever. There was some glandular enlargement and but little temperature (101° F.). There were no sequelæ. This disease has not been accepted as a clinical entity.

ROCKY MOUNTAIN SPOTTED FEVER.¹

(TICK FEVER OF THE ROCKY MOUNTAINS, PIROPLASMOSIS HOMINIS, BLACK FEVER, BLUE DISEASE, SHEEP CAMP FEVER.)

The above titles designate an acute infectious disease accompanied by mild or severe constitutional symptoms with a cutaneous exanthem having multiform characteristics.

It was first described by Wood in 1896 and in 1899 by Maxey, since which time many observers have made reports concerning its clinical, pathological, and bacteriological aspects; unrecorded cases have been noted in some of the regions where it is now prevalent since 1873. The disease is found chiefly in the Rocky Mountains in the states of Montana, Idaho, Utah, and Oregon.

Symptoms.—The disease is ushered in, as are many infectious processes, with chill or chilly sensations, malaise, followed by a rapid rise of temperature, general soreness over the entire body especially severe in the back and legs. Headache is common and epistaxis is frequently associated and may be severe during the second week. The tongue is coated and constipation is the rule. The temperature rises suddenly after the onset and remains more or less high from 100° to 105° or 106° F., for ten to twelve days when in mild cases it begins to decline, reaching the normal in the third week. The eruption occurs in from three to five days after the onset on the wrists, ankles, and back, and gradually spreads over the limbs and trunk including the palms and soles in some cases. Late in the disease it may involve the mucous membrane of the mouth and throat. It appears in crops like a purpuric toxic erythema, the first lesions being pinkish or reddish macules which later become darker in color and finally hemorrhagic. In severe cases intense hemorrhagic areas may occupy the entire cutaneous surface. Diffused over the surface there is usually an icteric discoloration in addition to the lesions described. The eruption terminates with desquamation during convalescence. Desquamation is most marked on the hands, feet, and face.

With the rise of temperature the pulse rate increases from 110 to 140 in average cases and the respirations range around 36 per minute.

¹ Bibliography: Wood, Rept., Surg. Gen. Army, 1896, pp. 60–65. Maxey, 1899, Medical Sentinel, vii., pp. 433–438. Wilson and Chowning, J. A. M. A., 1902, xxxix., pp. 131–138; and Journ. Infect. Dis., 1904, i., pp. 31–57. Anderson, Bulletin 14, Hygienic Laboratory of United States Public Health and Marine Hospital Service, 1903. Stiles, *ibid.*, No. 20, 1905. Ricketts, J. A. M. A., 1906, xlvii., pp. 33–36, p. 358, and pp. 1067–1069; Journ. Infect. Dis., 1907, iv., pp. 141–153. King, 1906, Public Reports, July 27th. Idaho, State Medical Association, 1908; J. A. M. A., li., Nov. 21st; Symposium on Rocky Mountain Spotted (Tick) Fever, papers and discussions by Stewart and Smith, Maxey, Ricketts, Tuttle, Numbers, McCalla, Taylor, Kleinman. Osler's Modern Medicine, Vol. iii., pp. 535–540.

A moderate bronchitis is common and pneumonia is a frequent complication. Nausea and vomiting may occur during the second week and may be intense in severe cases. The spleen is enlarged and tender and the liver shows some increase in size. Hemorrhages may occur from the nose, mouth, stomach, and bowels, and hemorrhagic effusion into the joints has been recorded. The urine is diminished in amount and high colored, and may show traces of albumin and some casts. The nervous manifestations include restlessness, irritability, pain, hyperæsthesia, and in severe cases delirium and stupor, while coma usually precedes death. The blood shows a diminution of red cells and hæmoglobin. The leucocytes are either normal in number or moderately increased (8000 to 14000) with an increased percentage of the large mononeuclears.

Pneumonia, and gangrene of the skin of the terminal extremities, scrotum, and penis occur as complications.

Etiology and Pathology.—The disease occurs usually during the spring months from March to July—May and June furnish the major portion of cases. It attacks both sexes and may occur at any age. The infective agent is inoculated in most instances by the bite of a tick (*Dermacentor Occidentalis*). Several hundred cases occur annually and the virulence varies in different years. In Montana a more severe type of the disease is usually noted. It occurs commonly among people who are closely associated with sheep herds in the mountains. Ricketts and others have reproduced the disease in animals (monkeys, rabbits, and guinea-pigs). He also has demonstrated the susceptibility of several animals indigenous in that locality to the disease (gopher, ground-hog, chipmunk, rock squirrel, and mountain rat).

The various theories concerning the life history of the micro-organism (as yet not isolated) with its numerous hosts are interesting but cannot be detailed here.

The chief pathological findings, *post-mortem*, have been noted in the skin, spleen, liver, pancreas, and kidneys.

Treatment.—No specific medication is known and opinion is divided concerning the value of quinine. The general care of the patient with symptomatic treatment and good nursing give best results.

Prognosis.—The average mortality ranges from four to ten per cent.—at times a much higher rate has been recorded. Death usually occurs during the second week of the disease.

CLASS II.

HEMORRHAGES.

PURPURA.¹

(Gr., *πορφύρεος*, purple.)

Purpura may be a symptom or a disease—that is, it is symptomatic or idiopathic. It may be defined as a condition in which there occur spontaneous hemorrhages in and beneath the skin and mucous membranes. The disease, purpura, differs from hemophilia in that it is acquired and, as a rule, transitory; and from scurvy by its non-epidemic and non-endemic nature.

Classification.—A grouping of the secondary purpuras is not difficult—authorities agreeing more or less generally on the morbid states in which hemorrhages occur as a symptom. A satisfactory classification, however, of the idiopathic variety cannot be made until the pathology of the condition is better understood. It can be urged, nevertheless, with good reason that all purpuras are not symptomatic—that is, there is a true idiopathic purpura.

Secondary Purpura.—Hemorrhages may occur in the course of any acute infectious disease. They are more common in variola than in any of the other exanthemata. There are hemorrhagic forms also of measles and scarlet fever. In the diagnosis of ulcerative endocarditis, petechiæ are of great significance. Epidemic cerebro-spinal meningitis derives its name, “spotted fever” from the frequent occurrence of a hemorrhagic eruption. Purpura may take the place of rose-spots in typhoid fever. In typhus fever the eruption is always purpuric. Pyemia and septicemia may show very abundant ecchymosis.

Toxic Purpura.—A long list of drugs may cause the appearance of purpura. The iodids are especially prone to lead to hemorrhages, idiosyncrasy being a prime factor. In addition to the cutaneous manifestations, there may be marked febrile disturbances. Copaiba, quinine, ergot, mercury, chloral, salicylic acid, arsenic, and belladonna may also lead to a purpuric rash. Snake venom is a well known etiologic factor made use of in the production of experimental purpuras.

Cachectic Purpura.—This is the type seen most commonly in hospital practice. Thus in chronic nephritis and heart disease, the

¹ The author is indebted for much of the recent material embodied in this article to the monograph by Joseph H. Pratt found in Osler's “Modern Medicine,” Vol. IV., pp. 681-716. In these pages idiopathic purpura has a distinct place founded on new and painstaking research.

development of hemorrhages especially on the legs, is of comparatively frequent occurrence. In the anemias—primary and secondary—in the leukemias, in Hodgkin's disease, tuberculosis, carcinoma, chronic alcoholism in the senile state, and other disturbances of nutrition, hemorrhages are not unusual symptoms.

Nervous Purpura.—Purpura may occur both in the organic and functional diseases of the nervous system. In tabes, following the lightning pains over the area where the latter have been most intense; in acute transverse myelitis; in insular sclerosis; in hemiplegia on the affected side; and in the neuralgias, hemorrhages sometimes appear. Among the causative factors, functional in nature, are fright, hysteria, the menstrual state, and stigmatization in which bleeding-points appear upon the unbroken skin.

Mechanical Purpura.—Examples of this appear often after the paroxysms of cough in pertussis and after the seizure in epilepsy.

The application of a tight bandage may lead to a hemorrhagic rash. A mechanical influence also is effective, probably most commonly in the development of purpura on the lower extremities.

Idiopathic Purpura.—In the tables shown by Pratt there are 194 cases of primary to 258 cases of secondary purpura. The disease is most common among males in the second decade. Season and heredity play a part in the etiology. (See CERVICAL VARIETIES, p. 447.)

Pathogenesis.—The question of pathogenesis is still unsolved. Microorganisms have not been found in blood cultures. The condition of the blood-vessels is important but whether the changes are primary or secondary is not known. Focal degeneration, thrombosis, and a solution of the endothelial cells have all been described as causative factors.

Two constant findings seem to be present in the blood—a diminution of the blood-platelets and disinclination of the blood-clots to contract.

General Symptomatology.—The lesions of purpura have the following characteristics in common: They all are due to escape of blood into the tissues; they do not fade under pressure; they usually appear suddenly; at first they are of a bright- or deep-red color, which in a few hours or days changes to the duller and darker shades of red, purple, and brown, which in turn, beginning at the centre, slowly fade through various shades of brown, green, and yellow to the normal color of the skin. On the lower extremities the pigmentation sometimes persists for years. According to their shape, size, and arrangement, the lesions of purpura are designated as *petechiæ* which are pin-point- to small coin-sized, usually well-defined macules, sometimes situated about the hair-follicles; *ecchymoses*, which are like petechiæ, except that they are larger and more irregular in shape and in distribution, sometimes covering the entire surface of a limb; and *vibices*, which are linear and band-like arrangements of ecchymoses. Occasionally the hemorrhage takes the form of bullæ (*bullæ hæmorrhagicæ*), or of nut- to egg-sized, and even larger, tumors

PLATE XVII



Purpura Due to Copaiba.

(From a painting.)



(*ecchymomata*). At times purpura is seen in the form of minute papules. In addition to the clinical forms above described, purpura may appear as a complication and modification of the various lesions of erythema multiforme, urticaria, and other cutaneous diseases. The disorder may be recurrent or even persistent. Osler¹ reports a case of purpuric erythema, of eight years' duration, associated with pigmentation of the skin and enlargement of the liver and spleen.

Diagnosis.—The diagnosis of the symptomatic purpuras rests upon the discovery of the etiology. The idiopathic variety is recognized by the absence of any tangible causative factor; while the different types are distinguished by the features mentioned in the following paragraphs.

In addition to the distinctive signs of scurvy and hemophilia, the epidemic nature of the former, and the congenital or hereditary factor in the latter, should make a diagnosis easy.

Treatment.—Attention, in the symptomatic form, should be given to the underlying condition. Rest and a light nourishing diet are indicated in all cases. Foods rich in iron and fresh fruits are of value. Warm baths are to be recommended during the course of the disease and in convalescence. Among useful drugs are Fowler's solution in increasing doses, aromatic sulphuric acid, calcium salts for a few days at a time, and oil of turpentine. The salicylates and the coal tar products are, as a rule, of little value. Locally, in bleeding from the mouth or nose, irrigation with 1 to 1000 adrenalin or two per cent. gelatin is useful. Iron is indicated during convalescence.

Prognosis.—In the secondary purpuras, the outlook depends upon the gravity of the causative factor.

Of the idiopathic types, simple purpura, with and without arthritis, is nearly always of favorable prognosis; purpura fulminans and Henoch's purpura (especially associated with nephritis) not infrequently terminate fatally. Cerebral hemorrhage is a common cause of death.

CLINICAL VARIETIES OF IDIOPATHIC PURPURA.

Purpura Simplex.—This type is characterized by the appearance, in crops, of a purpuric eruption. The form is usually petechial and the site of election the legs. The rash is ordinarily the only symptom, though slight fever, joint pains, and gastro-intestinal disturbances may be present. The average duration is from two to six weeks, though the case may become chronic and last a year or more.

Purpura Rheumatica.—Simple purpura with arthritic manifestations.

This variety of purpura, which has a striking analogy to erythema multiforme, is probably an exaggerated form of some of the conditions recognized under that title. It is preceded as a rule by febrile or other premonitory symptoms associated with arthritic pains, especially of the knees and ankles, which may become swollen or be affected with

¹ J. C. D., 1903, xxi., p. 297.

a hydrarthrosis. In a few days petechial to ecchymotic, light-red to dark-purplish maculations appear upon the extremities, the trunk, or the entire surface of the body, not fading under pressure, and usually with coincident relief of the arthritic pain. The subjective sensations are ordinarily trivial. In a fortnight the eruption may subside, its color undergoing the usual variations from greenish to orange and light yellow; but relapses are common in the course of weeks, with recrudescence of the fever, return of rheumatoid symptoms, and progressive asthenia. The purpuric spots sometimes make their appearance regularly in the afternoon or evening, sometimes daily and often with several days' interval, accompanied by pain, stiffness, and swelling of joints. The arthritic symptoms are extremely variable and may be slight or severe. While most common in the knees and ankles, they may appear in any joints of the body. Associated with the purpura and the arthritic symptoms there are often mild or severe gastro-intestinal disturbances.

There are thus, in the majority of cases, three groups of symptoms, the cutaneous, the arthritic, and the gastro-intestinal. It is rare, however, for these symptoms to be equally severe in any one case, one or two of the groups being usually but slightly or not at all apparent. Frequently one group follows another. Thus, the arthritic pains may subside before the appearance of the purpura, or the reverse may be true. Throat-lesions, acute circumscribed œdema,¹ and urticaria are often seen with one or more of the groups of symptoms above described. The intimate relation of purpura rheumatica to erythema multiforme is discussed in the pages devoted to the latter disorder. Cases are described in which there was coincidence of purpura rheumatica with renal hemorrhage, albuminuria, and gangrene of the soft palate. Cases are also on record in which there were cardiac involvement and grave disorders of other viscera.

The disease occurs in both sexes, though more often in young men, and is to a certain extent influenced by the changes of climate and season. Its diagnosis, in consequence of its marked characteristics, coincidence of petechiæ and ecchymoses with rheumatoid pains, is effected readily. Duhring calls attention to the danger of confounding the disease with the macular syphiloderm, the lesions of which, however, when relatively recent, fade under pressure.

Purpura Hemorrhagica (*Morbus Maculosus Werthoffii*).—This type is characterized by the association of severe purpura with hemorrhages from the mucous membranes. The disorder is usually ushered in with phenomena of a febrile character, accompanied by symptoms of general depression. Subsequently ecchymoses appear upon the extremities and the trunk, both spontaneously and at points at which the integument has specially been subjected to pressure and friction. Often petechiæ appear simultaneously upon the nasal, laryngeal, buccal, and other mucous surfaces, which may also be the seat of exhausting hemorrhages, resulting rarely in fatal collapse. A symptomatic

¹ Cf. Bowen, J. C. D., 1892, x., p. 434 (references to literature).

fever is usually awakened. The disease occurs most commonly in delicate young females, but may attack robust adults of either sex. Purpura hæmorrhagica is slow in its course, but, as a rule, terminates favorably after the lapse of several months. In some instances the general symptoms are those of typhoid fever; and hemorrhage from the mucous surfaces, including those of the stomach and intestines, may be severe. In yet severer cases, to which the name *Purpura fulminans* is applied, the symptoms are those of septicæmia or of other acute and severe infection. In these cases extensive internal hemorrhage may be followed by death. Little¹ reports a series of cases in infants with a rapidly fatal termination and associated with hemorrhage into the suprarenal capsules. Many of the severer cases of hemorrhagic purpura undoubtedly are due to infections the exact nature of which is not understood.

The lesions commonly appear first on the upper extremities, then over the trunk, and finally over the lower extremities. They are usually dark red or purplish in hue, varying in size from that of a pin-head to that of a bean, but they may be of the size of the palm.

Henoch's Purpura.—This type is seen chiefly in children and, according to Osler, has the following characteristics: (*a*) Relapses or recurrences often extending over several years. (*b*) Cutaneous lesions which may be simple purpura, purpura urticans, urticaria, angioneurotic edema, and erythema in all its multiform varieties; in successive attacks, the skin lesions may vary greatly. (*c*) Gastro-intestinal crises, pain, vomiting and diarrhœa. (*d*) Joint pains or swelling, often trifling. (*e*) Hemorrhages from the mucous membranes. (*f*) Enlargement of the spleen. (*g*) Nephritis which is the most serious feature and the most frequent cause of death.

¹ B. J. D., 1901, xiii., p. 445 (with bibliography).



CLASS III.

HYPERTROPHIES.

KERATOSIS.

(Gr., *κέρας*, a horn.)

General considerations respecting the several disorders commonly included under the titles Congenital and Acquired Keratoses, Hyperkeratoses, and Dyskeratoses:

Keratosis was first applied by Lebert to hypertrophic lesions of the epidermis. It has since been made to include changes in both the epidermis and the corium, and it is employed by some authors in a generic sense to embrace a number of both localized and general hypertrophies of these portions of the skin.

The disorders springing from abnormal development of the horny layer of the skin, and its associated morbid phenomena even though first observed in later life are often of congenital origin. In some instances the extreme picture can be recognized soon after birth; in other cases the skin of the new-born infant to the untrained eye scarcely exhibits unusual symptoms; in its further development, however, the child in the course of months or years may exhibit one or more of the several diseases and deformities suggested by the titles named above—in mild or severe expression.

Reviewing this series of congenital keratoses, it is to be admitted that in the past enormous confusion has clouded the recognition of the character of the individual disorders and their mutual relations. Lenglet,¹ recognizing the difficulty of establishing the pathogeny of these conditions, either on an anatomical basis or on the ground of the agencies which influence the skin after birth, has established a classification which at least attempts to solve the problems presented. It is founded on two essential facts: the first is that the embryonic epiderm is constituted of two distinct layers, the most superficial representing the epitrichial layer found in the lower animals which if it adheres too firmly to the deeper layer and be not normally shed, results in (a) the advent of the infant into the world completely encased in an envelope which overlies the deeper cutaneous structures, or (b) the epitrichial layer surviving, profoundly influences the underlying integument and in this way lays the foundation for further changes. The second fact of importance is the change in evolution produced by many agencies obscure in operation, which profoundly influence the deeper layer. Hence result the clinical forms in which

¹ Annales, 1904, s. 4, iv., p. 369.

there is either absence of or an abnormal production of the skin appendages.

The list of disorders directly or indirectly originating from these foetal layers are classified as follows:

Anomalies of development of the appendages of the skin and its allied structures originating from the same germinal source (glands of the skin, body-hairs and those of the hairy scalp, nails, teeth). Under this title are to be classed the cases in which there is practically absolute and generalized failure of production of these accessories of the skin including its glands, and also those in which these are produced in incomplete development. Under the one title are included cases of complete alopecia with absence of sweat and sebaceous glands; and under the other are the associated conditions, monilethrix, keratosis pilaris, ichthyosic, keratodermic, and parichthyosic, with lesions of the nails, epidermolysis bullosa, and ichthyosiform erythrodermia.

In a subdivision are classed those in which though the papillæ of the corium exist, they are wholly inactive; under this head Lenglet classes, first, persistence of the lanugo after birth (producing the hypotrichosis lanuginosa, of Bonnet; the primitive trichostasis, of Unna).

After the fall of the lanugo, the hairs are replaced by abnormal filaments (monilethrix) or there is no growth.

The more complicated processes which follow the conditions named above, include the palmar and plantar keratodermias of congenital origin, the common forms of ichthyosis, and the foetal form (so-called "Harlequin foetus").

Under the title "lamellar exfoliation of the skin of the new-born" are included those cases in which the infants at birth have a dry, shiny, yellowish-brown skin looking as though it had been varnished with collodion. The ichthyosiform congenital erythrodermia, of Brocq, includes those cases in which over the face and over the folds of the body, accompanied sometimes by bullous lesions and also by palmar and plantar keratosis, there is frequently an exaggerated growth of the hairs and nails, palmar hyperidrosis, alopecia, atrophy of the skin, and dilatation of the orifices of the sebaceous glands.

Congenital bullous lesions are often associated with palmar and plantar keratoses due, as Lenglet thinks, to the special friability of the inter-cellular spines. In these cases the slightest friction and pressure upon the keratotic skin suffice to induce the appearance of blebs. In many cases the blebs are hemorrhagic; they are often accompanied by hyperidrosis; there is frequent pigmentation of the skin in the neighborhood.

Briefly, the congenital dyskeratoses thus outlined are: lamellar desquamation of the skin of the new-born; foetal ichthyosis; the ichthyosic congenital erythrodermias; palmar and plantar keratodermias with their associated symptoms; the circumscribed or generalized symptoms of cutaneous atrophy; the various morbid conditions pre-

ceding, complicated by bullous lesions; lastly, the ordinary forms of ichthyosis.

KERATOSIS PILARIS.

(LICHEN PILARIS, PITYRIASIS PILARIS.)

Symptoms.—This condition may be a mere temporary functional disturbance of the skin, awakening no subjective sensation, inappreciable by the patient and apparent only to the careful observer, or it may constitute a disease. Its symptoms are the occurrence of pin-head sized, pointed elevations of the skin-surface that may be described as papules, though strictly speaking, they are not such, but are constituted by an accumulation of horny epithelia and a small quantity of inspissated sebum about the lanugo-hairs of the extensor surfaces of the extremities and trunk. These aggregations of material are usually of a dirty-whitish or grayish hue, and are pierced by a lanugo-hair implanted in the follicle about which the abnormal condition exists. Occasionally, however, the hairs are of the finer and shorter kind, and are often coiled in or otherwise covered by the little heaps of epithelial débris. The skin of the individual thus affected is generally harsh, squamous, and dry to the touch, suggesting that it has been long unwashed. The color of the quasi-papules differs also with the complexion of the individual; at times the papules have a distinctly reddish tinge, and they are often surmounted by a scale.

Keratosis of this type can scarcely be described as a morbid state. Those who seek treatment for it are readily divided into two classes: first, comely young women desiring to exhibit bare arms in evening toilet; second, young men suffering from the delusion that they are victims of a "disease of the blood" or of syphilis. Viewed as a whole, the subjects of the best types of this so-called "disease" are men and women of exceeding vigor, with firm, well-developed muscles and shapely limbs.

Keratosis pilaris is common in skins long uncleansed by ablution, and this condition can thus be produced artificially. In some individuals it persists for long periods of time, and awakens no concern. In others, especially in children, it may become the source of pruritus, and each lichenoid papule may then be transformed into an urticarial wheal, with distinct and sometimes very annoying pricking and tingling sensations, the trouble often relieved by a bath in warm water with soap. In other individuals, especially in adults, an exaggerated form of the disease can be recognized, the skin presenting a roughness to the touch suggestive of the surface of a nutmeg-grater, and exhibiting numerous fine, conical, grayish, horn-tipped filaments, which has been regarded as a form of ichthyosis. In the latter case there is doubtless a true hypertrophy of the epidermis. In the former case there is scarcely more than a mechanical accumulation of effete organic material. The malady, simple though it be in character at the

onset, may become the first stage of a series of chronic cutaneous disorders. Tilbury Fox has reported four cases in which the disease was well marked, under the title of *Cacotrophia Folliculorum*, this name being employed to designate its peculiarities as to wide distribution over the body, its implication of the deeper portion of the follicles, and its congenital history. In these cases the reddish tint of the lesions is shown distinctly.

Brocq¹ describes a white variety, the uncolored circumpilary papules being scattered over the arms, forearms, legs, and thighs, usually on the outer faces of the extremities; and three inflammatory types: (a) a mild form, in which reddish papules are disseminated among those of the "white" class; (b) a form of medium intensity, in which the papules are generally rosy-red in hue; (c) an intense form in which well-marked lesions occur over the surface of the chest, the lumbar and pubic regions, and the folds of the larger articulations.

Keratosis pilaris on the face, as described by French writers, is characterized by exceedingly minute, usually conical, occasionally obtuse papules (each pierced by a fine hair) that develop over the brow, about the eyebrows, over the cheeks, and the infra-maxillary region.

Etiology.—Puberty and uncleanness have been assigned as causes of the disorder; both conditions may in some patients be indirectly effective. In certain individuals the condition seems to follow a prolonged course of arsenic. The disease is seen frequently in persons having peculiarly thick, coarse, usually dark-colored skins, and also possessing marked muscular vigor and unusual development of most of the other bodily tissues. In brief, the disorder seems to be due often to marked inherited predisposition in persons of vigorous constitution. The varieties of keratosis pilaris seen in cachectic hospital-patients, and in persons who have aggravated the disease by inducing a medicamentous rash upon the person, belong to a different category. Patients in the two classes last named may be so perfectly relieved that there is no predisposition to a return of the disorder, a relief not always to be secured by the others.

Pathology.—The papules are produced by a hyperkeratosis about the orifices of the pilo-sebaceous follicles. In some cases the result is an irritation which produces a mild degree of chronic inflammation of the periglandular tissue. Giovannini² found, in twenty-five cases, that inflammation was not constant, but in some instances was a marked feature. He found that the follicular orifices were much widened and deepened, and filled with a horny plug in which there were coiled often one or more fine hairs. The hyperkeratosis involved not only the follicle, but also the epidermis about it. There was more or less atrophy of the outer root-sheath of the sebaceous glands and of the erectores pilorum. In a few instances the entire

¹ *Annales*, 1890, s. iii., i., pp. 25, 97, and 222 (an extensive review of the subject, with bibliography).

² *Lo Sperimentale*, 1895, p. 662; abstr. in *B. J. D.*, 1896, viii., p. 151; and *Archiv*, 1902, lxiii., p. 163, with bibliography.

follicle, including the hair-papilla, was destroyed. Unna believes that the process is essentially inflammatory.

Diagnosis.—The disease should readily be recognized by the peculiarities of its seat, its course, and the nature of its symptoms. From ichthyosis it can be distinguished by the limitation of its lesions to the orifice of the hair-follicle; from the transitory condition known as “goose-flesh” by its persistence after the surface of the skin is thoroughly warmed; from papular eczema and the other lichenoid eruptions by the relatively insignificant character of the lesions, their evident follicular origin, and either the entire absence, or mild chronic type, of inflammatory symptoms.

The disease is to be carefully differentiated from pityriasis rubra pilaris, in which the characteristic disorder of the scalp, the appearance of plaques of disease covered with fine pityriasic scales (often upon the tip of the nose and chin) exhibiting a peculiarly dark, smirched appearance, the affection of the nails, the characteristic papules on the dorsal surfaces of the first and second phalanges of the fingers, and the evident admixture of the disease with symptoms of seborrhœic type, suffice to determine its nature.

Though the lesions of keratosis pilaris bear little resemblance to the papular syphilodermata, many male patients for years swallow medicaments for relief of a supposed syphilis the sole “symptom” of which is a keratosis pilaris. The papular syphilodermata are not persistent year after year, are not throughout symmetrical, and are not limited largely to the outer faces of the limbs, especially of the thighs. They are preceded by a history of infection, and are accompanied by other manifestations of the disease. They are not limited to the orifices of the hair-follicles, and are not capped by the peculiar horny scaling tip of the papule of keratosis pilaris.

Treatment.—For the subjects of keratosis pilaris in typical form it is not sufficient merely to order a bath. The bathing should be conducted systematically for years at a time.

As soon as it can well be tolerated the patient should be urged to bathe the entire surface of the body every morning by the use of the sponge and cold fresh or salt water, following this with brisk friction with a coarse towel or a flesh-brush. In other cases, warm alkaline baths are required. The habitual use of this cold bath continued daily for years, in persons who can tolerate it (and patients affected with keratosis pilaris are usually of this class), accomplishes results of the most satisfactory character, exerting, as it does, a profound influence on the nutrition and healthfulness of the skin.

For immediate treatment of the most of these cases, however, the hot bath with soap is desirable. This bath may be repeated as often as required to remove the lesions, and be followed in the more urgent cases by inunction with lanolin-pomades, or the fats or oils. Salicylic acid, 1 to 10 per cent. in oils or ointments, is effective in removing temporarily the horny accumulations. In the congenital and severe types, such as those described by Fox, cod-liver oil internally should be ordered.

KERATOSIS FOLLICULARIS SPINOSA (UNNA).

(LICHEN PILARIS, SEU SPINULOSUS [Radcliffe-Crocker and Adamson]; LICHEN SPINULOSUS [Divergie]; ACNÉ CORNÉE [Hardy, Guibout, Leloir, Vidal, and Hallopeau]; KERATOSE FOLLICULAIRE [Barbe]; KERATOSE PILAIRE ENGAINANTE [Audry]; ACNE CORNEA [Giovannini¹].)

Symptoms.—Keratosis spinosa in an affection similar in symptoms and histological changes to keratosis pilaris, occurring most often in children, in boys more than in girls, though occasionally it has been observed in adults. It is characterized by the development of filiform spines, projected from pilo-sebaceous follicles, the orifices of which become minute acuminate papules of a pinkish red hue. The eruptive symptoms may develop in acute or subacute type with agglomeration in patches especially over the buttocks, neck, trochanteric regions, abdomen, popliteal spaces, and extensor aspect of the arms, often in crops. The face, hands, and feet are commonly spared. The itching is slight.

The horny spines project about one-sixteenth of an inch from the surface and can be picked out, leaving a depression in the centre of the papule.

The disease was first described by Radcliffe-Crocker and Fox, though other English observers have recorded cases to the number of several scores, the disease, however, being admittedly rare in England. Its relationship with the several affections described by French and German authors under the titles given above is presumably close, many of the Continental cases recorded being identical with those described by English writers. The exact type of the disease as it occurs in England seems not to have been as yet described in this country.

Etiology.—The cause of the disease is unknown.

Histopathology.—Adamson describes a horny plug distending the upper third of the follicle and extending beneath the general level of the epidermis composed of concentric lamellæ of flattened horny cells with acanthosis of the cell-wall. The chief contested point between writers on this subject, concerns the question of inflammation as a preceding or coincident symptom. Adamson agrees with Radcliffe-Crocker and others that the disorder is a hyperkeratosis, essentially admitting that at an early period there may be "congestion and slight effusion around the follicle." Lewandowsky,² however found that his case was one of follicular inflammation with secondary parakeratosis. By reason of the suppuration preceding the spine-formation in Lewandowsky's case the English observers are disposed to exclude it from the category of Lichen spinulosus, or Keratosis spinosa.

Treatment.—The treatment is that of keratosis follicularis and the prognosis favorable.

¹ Crocker, 3d ed., 1905, p. 452; Adamson, B. J. D., 1905, xvii., pp. 39 and 77 (with full bibliography to date, summary of previously reported cases and 3 excellent plates).

² Archiv, 1905, lxxiii., p. 343.

KERATOSIS SENILIS.

Symptoms.—The skin of the aged may become harsh, dry, and unusually cornified either diffusely or in certain definite regions, such as the hands, feet, or extremities; this may be regarded as the simplest form of keratosis senilis. The skin of the entire body or of the region affected such as especially the face, neck, and dorsa of the hands is then dark in color, dry to the touch, occasionally covered with fine, rather adherent scales, representing merely attached and cornified cells of the horny layer of epidermis, and notably unprovided with the natural unguent of the skin.

In a more advanced grade the skin undergoes changes closely allied to epithelioma; often, indeed, these both furnish the first symptoms of epithelioma and coexist with its gravest destructive effects. The skin, more commonly of the face, the hands, or the forearms, less often of the feet, the legs, and the genital regions of the aged, is covered with thin, horny, often greasy-looking, pin-head- to finger-nail-sized and larger, dark-yellowish freckles, plates, or scales, between which the integument that has undergone the atrophic changes in the senile skin is visible. Pigmented puncta and macules may also appear scattered irregularly over the surface, with rough, dirty-yellowish to dark-brownish, granular accumulations upon the skin of certain regions, such as the clefts beside the alæ of the nose, the temples, etc. When these warty, flattened, or elevated plaques are removed the underlying surface may be atrophic, excoriated, hemorrhagic, or even ulcerated. The appearance is suggestive in some cases of a seborrhœa sicca of the face. In many patients exhibiting these features a fully developed papillomatous, superficial, or deep epithelioma may be present. In other patients one or more varieties of the senile wart may be visible, as described in the chapter on Verruca.

The boundary-lines between senile keratosis and epithelioma are not well established. The exaggerated lesions of the former affection are frequently the first stages of the latter disease, and in the treatment of the skin of the aged, conducted on the general principles already set forth, the physician should never lose sight of possibly serious consequences in one or more regions of the skin affected.¹

Treatment.—In the earlier stages of this condition, the simpler methods of treatment may be effective, such as ablutions with toilet soap and water, or borax and water, followed by the application of one of the simpler salves. Pomades containing one to three per cent. of sulphur and salicylic acid or white precipitate (one part to fifty of cold cream salve) may be employed with advantage. Curetting lightly with ensuing applications of one grain (0.06) of bichloride of mercury to the ounce (30.) of tincture of benzoin may avert further trouble, as also painting with saturated solutions of pyoktaniin blue in water. The salicylated plaster-mulls, and radiotherapy in

¹ Cf. Hartzell, J. C. D., 1903, xxi., p. 393 (bibliography).

three minute exposures, with cessation on the slightest evidence of reaction, are exceedingly useful remedial measures. Radical treatment is desirable in all cases unmistakably epitheliomatous in character.

Prognosis.—The prognosis is to be formulated with due caution, in all patients with multiple lesions, a suggestive change, for example in the face coexisting with several wartlike horny growths on the backs of the hands. The hygienic and simple treatment, outlined above, is often effective in delaying or preventing more serious degenerative changes.

KERATOSIS FOLLICULARIS.

(PSOROSPERMOSIS; DARIER'S DISEASE; ICHTHYOSIS SEBACEA CORNEA [E. Wilson]; KERATOSIS VEGETANS [Crocker]; ICHTHYOSIS FOLLICULARIS. *Fr.*, PSOROSPERMOSE FOLLICULAIRE VÉGÉTANTE; ACNÉ SEBACÉE CORNÉE.)

In 1889 Darier and Thibault in France; White in America; and later, Wickham, Neisser, and others, called attention to a cutaneous disorder not previously distinguished from other maladies. About fifty instances have been recorded chiefly by observers whose names are given in the appended bibliography.

Symptoms.—In the cases reported the eruption was practically generalized, and exhibited first over the head and face but in greatest abundance over the limbs, the front of the chest, the inguinal and genital regions, and the loins. In one of Bowen's cases the head and feet only were affected. The lesions were firm, pin-head-sized papules, scarcely different in color from that of the surrounding integument, which later assumed a deeper hue, and, whether flattened or hemispherical, these papules were soon covered with a grayish or brownish crust, greasy to the touch and apparently prolonged into depressions beneath, much as the crust of seborrhœa sicca of the face is sunk within the orifices of the sebaceous follicles. The papules, as they increased in size and age, became darker in hue until eventually they were a deep brown and red, or even purple. A few exhibited scratch marks and were covered with hemorrhagic crusts. This was the classical picture presented in the patient examined by me at the first International Congress at Paris, and recognized by White as identical with that reported by him.

Over the scalp the symptoms are practically those of the crusting forms of seborrhœa, save that there is no tendency to loss of hair. Over the face the parts chiefly involved are the temples, the inside of the concha of the ears, and the folds about the nose and lips. Here, as over the parts of the trunk named above, form dark, even blackish, strata of dirty oil-crusts, spontaneously shed. Beneath each crust, as indicated above, there is usually a conical spur let into an infundibular depression, the latter representing the patulous orifice of a pilosebaceous gland. Over the backs of the hand and fingers the papules and crusts are less numerous, but the papules are closely set together and tend to coalesce. In the palms and soles are numerous almost

imperceptible lesions of the same type. As the disease advances to what has been described as a second stage the papules coalesce, forming small dark-brown tumors and papillomatous growths, which involve not only the follicles, but also the interfollicular tissues. Many of the follicles become the sites of superficial ulcers, while the whole of the vegetating mass is bathed in a more or less abundant, fluid, mucopurulent secretion. The subjects of the malady often emit an offensive odor.

The disease progresses gradually until large portions of the body are covered. Occasionally exacerbation with rapid spreading of the lesions occurs; but, as a rule, the course of the affection is slow and the general health of the patient does not seem to suffer except secondarily from the presence of ulcerating and suppurating lesions of the skin.

Etiology.—Little is known definitely regarding the etiology of keratosis follicularis. In the majority of cases recorded it began in childhood, and in several instances in early infancy. Of the cases collected, the greater number of patients were males.

The theory first advanced by Darier, and later elaborated by Wickham and others, that this variety of keratosis, and probably also Paget's disease, some superficial forms of epithelioma, and molluscum "contagiosum," were due to the presence of psorosperms or coccidiæ, has been abandoned even by its propounders. As a result of further study by Bowen, Buzzi, Miethke, Boeck, Darier, and others, these bodies, which closely resemble certain psorosperms, have been demonstrated to be produced by cell-transformation.

White's cases were in father and daughter, while Boeck had three cases in one family. Ehrmann¹ describes the case of a patient whose father he had seen in Janowsky's clinic with the same disorder. It is possible that contagion or heredity may have an influence in the production of the malady.

Pathology.—The disease seems to be primarily a hyperkeratosis or atypical keratinization involving the sebaceous follicles and the hair-follicles. The process is confined for the most part to the neck of the follicle, but in the later stages it extends to the interfollicular tissues. The mouths of the pilo-sebaceous ducts are dilated into funnel-shaped openings and packed with masses of horny cells produced by the hyperkeratosis. Boeck and a few other observers believe, however, that the process is not essentially follicular, but that it may begin outside the ducts. Bukowsky finds that the pathological process concerns not all but a limited number of the cellular elements.

The rete is usually thickened and in the later stages of the disease the interpapillary processes are prolonged. Mitoses are numerous, and in the lower layers of the rete are found fissures or lacunæ, the exact significance of which is not yet determined. In places the pressure of the horny masses may produce thinning and atrophy of

¹ Abstr. in B. J. D., 1902, xiv., p. 41.

the rete. About the borders of the lesions there is an abundant pigment deposit in both the epidermis and in the corium. The only other change noted in the corium is a small amount of cellular infiltration. The glands of the skin are unaltered. Kreibich¹ in the case of two women observed by him, recognized at the onset of a psorospermiosis follicularis that there was a precedent dermatosis resembling zona, the lesions rapidly becoming transformed into the papules of typical psorospermiosis; and in his second case also lesions disposed like those of intercostal zoster appeared in successive development. The author believes that the disease should be classed with the inflammatory dermatoses of angioneurotic type.

Constantin and Leverat² have given Darier's disease the name of pseudo-follicular dyskeratosis. The patient in Audry's clinic in whose case the skin lesions had been examined microscopically, exhibited numerous irregularities of the free surface of the epidermis with hypertrophy of the horny layer and pilo-sebaceous or sudoriparous openings which formed pockets for the concretions of the horn cells. The epithelium immediately next to these plugs was altered; acantholysis had occurred with the result of the production of the so-called pseudo-psorosperm bodies. At the level of the germinative layer, cells of the rete were changed; the prickles had disappeared and the cells became separated from their neighbors.

The round bodies formerly supposed to be psorosperms are found in the deeper and middle layers of the rete, and at the base of the horny plug filling the follicle. According to Bowen, they are swollen cells containing a nucleus which stains deeply, and which is surrounded by a clear or hyaline ring of protoplasm, outside of which is a zone containing granules of keratohyalin, the whole being surrounded by a homogeneous, glistening membrane, which may possess a double contour. Various modifications of this type are found as a result of irregular keratinization of the cells. In the upper layers, in which the process of cornification is advancing, the keratohyalin gradually disappears; but it may do so irregularly, and losing its granular appearance, may give rise to appearances closely simulating nuclei and nucleoli. In the upper layers also the outer membrane may contract or disappear, leaving an empty space. At the bottom of the horny mass in the follicle the stratum granulosum is frequently absent, and there are seen irregular, shrunken, homogeneous cells with nuclei which stain but feebly. These cells are the "grains" of Darier and Bowen believes they are cells which have become cornified without passing through the keratohyalin stage.

Diagnosis.—The disease is to be differentiated from molluscum epitheliale, which is never so generalized, and which always exhibits an enucleable mass containing the so-called "molluscous bodies."

¹ Archiv, lxxx., p. 367; Zum Wesen der Psorospermiosis Darier, Archiv, lxxx., p. 367; Annales, 1907, s. iv., viii., p. 302. Malinowski, Die Dariersche Krankheit Psorospermiosis follicularis vegetans, Monats., xliii., p. 209.

² Keratosis Follicularis—A New Case of Pseudo-Follicular Dyskeratosis of Darier, Annales, 1907, s. iv., viii., p. 337; B. J. D., 1908, xx., p. 204.



PLATE XVIII



Keratosis Punctata in a Man who had been taking Arsenic
for a long-standing Psoriasis.

The papular forms of acne are eruptive elements which contain centrally a true corneous mass; in keratosis follicularis there is a softish comedo-like central mass. The acne-forms, further, are not generalized. The disease bears close resemblance to some forms of ichthyosis, but a careful study of the history, the character, and location of the lesions will usually make the diagnosis clear. Acanthosis nigricans is far more localized.

Treatment.—The treatment is still undetermined. While marked improvement may be obtained, no complete recovery has been reported, and with a lapse in treatment the unfavorable condition of the patient quickly returns. The parts are to be well cleansed by shampooings, and then dusted with borated, salicylated, and absorbent powders. The French, acting upon the parasitic theory of the nature of the affection, vigorously employ parasiticides, salves containing salicylic acid, sulphur, ichthyol, resorcin, pyrogallol, or iodoform, and even resort to cauterizations with zinc chloride. Lieberthal and Mook seem to have employed radio-therapy with satisfactory results.

The prognosis in general is unfavorable.

KERATODERMIA PALMARIS ET PLANTARIS.

(SYMMETRICAL KERATODERMIA OF THE EXTREMITIES, CONGENITAL KERATOMA OF THE PALMS AND SOLES, ICHTHYOSIS PALMARIS ET PLANTARIS, TYLOSIS PALMARUM ET PLANTARUM; *Fr.*, KÉRATODERMIE PALMAIRE ET PLANTAIRE.)

Symmetrical and deforming keratosis of the palms and soles, sometimes of one set of organs more conspicuously than the other,

¹ Darier et Thibault, *Annales*, 1889, s. ii., x., p. 597, and Thèse de Paris, 1889. Darier Intern. Derm. Congress, Paris, 1889, and Intern. Atlas of Rare Skin Dis., 1892, Part 8, ii. White, J. C. D., 1889, June, and 1890, January. Boeck, *Archiv*, 1891, xxiii., p. 857. Lustgarten, J. C. D., 1891, Jan. Buzzi and Miethke, *Monatshft.*, 1891, xii., p. 9. Neisser, Second Intern. Derm. Cong., 1892, *Archiv*, *Ergänzungsheft*, 1892, xxiv., p. 80. Schwimmer, *ibid.*, p. 76. Schweninger und Buzzi, Intern. Atlas, 1892, Part 8. Pawloff, *Archiv*, xxv., *Ergänzungsheft*, 1893, p. 195. Fabry, *Archiv*, 1894, xxvii., p. 373. Mourek, *ibid.*, 1894, xxvi., p. 361. Jarish, *ibid.*, 1895, xxxi., p. 163. Neumann, *Wiener klin. Woch.*, 1896, No. 3. Bowen, J. C. D., 1896, June. Hallopeau et Darier, *Annales*, 1896, pp. 737-742. Bowen, *ibid.*, 1898, p. 6 (case limited to feet and hands). Melle, *Giorn. Ital.*, 1898, p. 365; *Ref. Annales*, 1899, p. 506. Jacobi, *Verhandl. d. Deutschen dermat. Gesell.* VI. Congress, p. 406, 1898. Caspary, *Festschrift*, Kaposi, 1900, p. 199. Ehrmann, *Wiener med. Presse*, 1901, No. 46. Hallopeau et Fouquet, *Annales*, 1902, p. 228. Schwab, Inaugural Dissert. Freiburg i. Breisgau, *ref. Annales*, 1903, p. 627. (This case seems to be identical with that of Jacobi.) Weidenfeld, *Archiv*, 1903, lxiv., p. 275. Ormerod and MacLeod, B. J. D., 1904, xvi., p. 321. Lieberthal, J. A. M. A., 1904, July 23. Mook, *Abstr. Monatshft.*, xliii., p. 362. Curl, J. C. D., 1905, xxiii., p. 403. Kreibich (with plates illust. two cases), *Archiv*, 1906, lxxx., p. 367. Malinowski, *loc. cit.* (case, 2 cuts, bibliog. to date). Sachs, O., *Wien. klin. Woch.*, 1906, Nos. 10 and 12 (abstr., *Monatshft.*, xlv., p. 164). Bukofsky, *Archiv*, 1905, lxxv., p. 279 (case, 4 figs. showing path. sections). Fasal, *Archiv*, 1905, lxxiv., p. 13. Jamieson, *Keratosis follicularis*, *Edinburgh med. Journ.*, 1907, p. 32; *Annales*, 1907, s. iv., viii., p. 350. Constantin et Levrat, *Keratosis follicularis*: Sur un nouveau cas de dyskératose pseudo-folliculaire de Darier, *Annales*, 1907, s. iv., viii., pp. 337-344. Stout, *Keratosis Follicularis*, *Philadelphia Derm. Soc.*, J. C. D., 1907, xxv., p. 125.

was first definitely described in a communication made by me to the American Dermatological Association in 1887 and later more fully by Unna in Germany, and by Besnier and Doyon, in France. Since then a number of important observations have been made on the subject, for the most part named in the appended bibliography.

Symptoms.—Observation of the cases recorded under the several titles named above, discloses the fact that they differ very greatly not merely in their symptoms but in their etiology. The chief symptom common to all is merely a corneous thickening of the palmar and plantar surfaces. The other conditions, in the different groups named below exhibit wide variations.

Congenital Palmar and Plantar Keratosis.—This is the rarer of the forms included in the list, though statements to the contrary have been made by several observers. Soon after birth, the palms and soles of the infant are found to be generally and uniformly covered with a dense thick corneous mass, less plate-like than in the other

FIG. 72.



Keratodermia palmaris et plantaris hereditaria.

types of the malady, and more rugous, verruciform, and cumbersome. The outline of the keratomatous patch is definite, commonly not extending to the dorsa of the affected organs; and rarely associated with hyperidrosis or environed with a pinkish halo. Instead of presenting the species of opaque dirty yellowish cast of the palm and sole seen in other cases, the parts are overspread with a dark-hued, often brownish or blackish wart-like integument, exhibiting rugous

elevations and between the latter depressions preventing full extension of hands and feet. The hollow of the foot and the centre of the palm are often not spared. The hands and feet are commonly equally and symmetrically involved. The condition resembles certain "hystrix" forms of ichthyosis. The teeth and hair may not be involved.

Acquired Palmar and Plantar Keratosis.—This is by far the most common of the conditions heretofore included in the list, and the symptoms are markedly different from those exhibited in the congenital forms described above.

THE HYPERIDROSIS TYPE.—In this form of palmar and plantar keratosis, there is invariable association with hyperidrosis, a condition upon which the keratoma is implanted and which is its chief etiological factor. The hands and feet, or hands only or feet only may be involved, usually symmetrically. The condition of hyperidrosis may be mild or exaggerated, and be dependent upon one of the toxic causes sufficient to interfere with circulatory equilibrium—(alcoholism, prolonged tobacco-narcosis, excess in use of sugar, tea, meat, etc., delicacy of constitution, cardiac disorder, etc.). The palms and soles are at first merely reddened, cool, and damp. Later, keratosis develops about the palmar faces of the fingers or toes, about the heel in a ring or over the hypothenar eminences. When fully developed, the instep, arch of the foot, and centre of the palm are commonly spared, being of normal color and moistened with effused sweat. For the most part the other palmar and plantar surfaces of hand, foot, fingers, and toes, are covered with a dull yellowish-hued cuirass-like plate well defined in contour and surrounded at the border by a delicate moist halo or areola of non-cornified epidermis the seat of passive congestion. The affection is seen in all grades, often the exterior face of the plate, especially over the heel, has a pitted aspect, due to irregularity of accretion of the horny substance. Very marked pitting with a nutmeg-grater-like appearance of the plate is often observed as in arsenical cases. Indeed many patients with hyperidrosis and palmar and plantar keratosis have taken arsenic under the direction of a physician.

The condition may persist, or greatly improve under appropriate treatment; or, even without treatment, almost wholly disappear under improved conditions of the general health and a duly regulated hygiene. The thickness of the plate may be one sixteenth to one eighth of an inch. Patients often complain bitterly of the soreness and discomfort induced by the presence of the calloused masses, locomotion when the feet are involved being in some instances greatly impeded.

In these cases the nails are usually in greater or less degree involved, the free border being up-tilted away from the phalanx of the digit, as well as thickened and at times even gryphotic.

THE ARSENICAL TYPE.—So many instances of keratosis involving the palm and sole have been treated by arsenic that no little obscurity obtains respecting the pure types of the one and the other, yet

a sufficient number of instances are on record where the clinical features were solely due to the medication.

When a keratosis of the palm or sole is due to arsenic, there is rarely, either, first, a rugous condition of the ichthyosis-type seen in congenital cases; nor second, the production of a relatively smooth dirty-yellowish pitted plate as in the hyperidrosis cases. Instead the palm or sole, occasionally the lateral surface of the digits in classical cases is rough, dry, thickened, and diffusely covered with smaller and larger discrete dirty-grayish warty projections from the plane of the normal skin. Some of them resemble ordinary warts; others are closely packed pin-head-sized papule-like bodies; yet others, in advanced cases, where the metal has for long been ingested, are much larger warty growths developing eventually into cancerous formations (epitheliomata, Hutchinson's "arsenical cancers"). Upon the sole the tendency is toward larger excrescences, especially over the posterior arc of the heel and the distal part of the metatarsus. In determining the nature of this change inspection of the skin of other regions of the body discloses often deep pigmentation in characteristic shades of dirty brown. In the arsenical cases, according to Hamburger,¹ the coloration is found in the corium, the epidermal cells being non-pigmented, dark granules of uncertain chemical composition, lying about the vessels in the papillæ and in the adventitia of the vascular walls.

For the melanoderma with verrucous alterations, and later epitheliomatous growths due to ingestion of arsenic, consult the chapters devoted to these subjects.

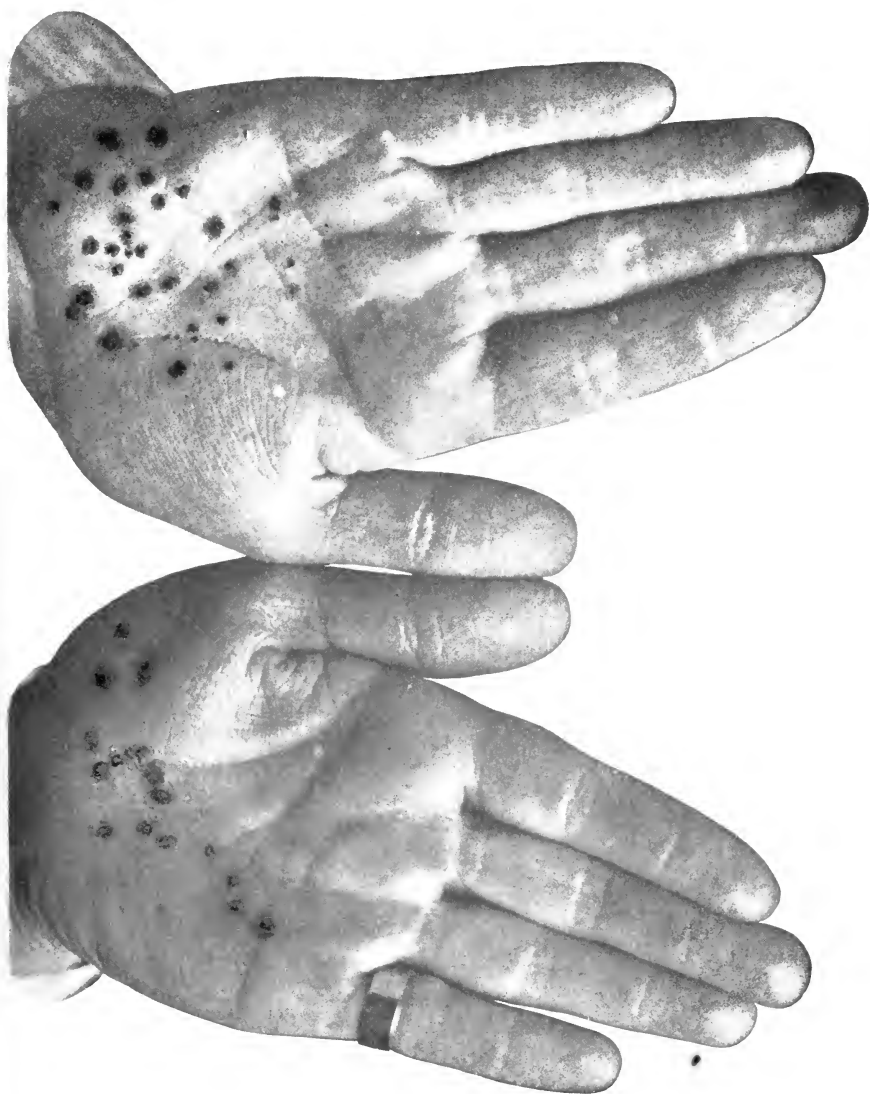
Palmar and plantar keratoses occur in men whose trades and occupations invite the occurrence of the changes described above. These are instances of compensatory cornification, protective in character, precisely as in the keratoma of the hyperidrotic patients, when there is increased vulnerability of the moistened skin. Often the special character of the labor pursued induces the callosity of palm and sole, as, for example in those who have to work in water and at the same time handle rough materials such as tiles, clay, plaster, etc.

The chief keratoses of the palms and soles may be usually assigned to one or another of the groups designated above, though a failure to recognize the relation between effect and cause is the source of confusion in attempts to classify the facts recorded. Brocq's "band-like" form may have been due in part to the occupation of the individual; Besnier's inflammatory halo about the lesions, and Brooke's "erythema keratodes" of palms and soles represent simply the often noted erythema stage, antedating the fully advanced keratomatous condition.

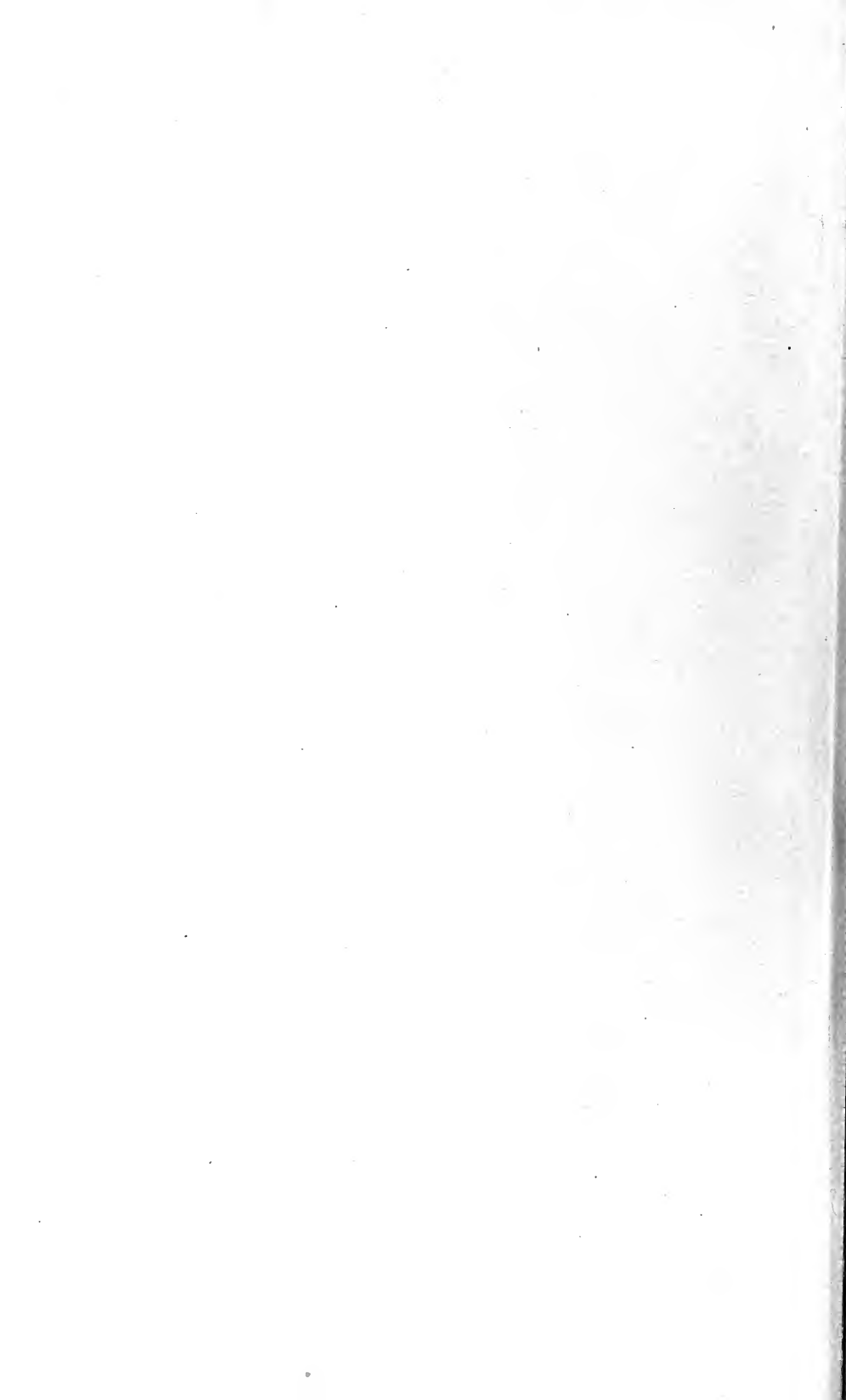
Etiology.—In congenital cases the condition may be recognizable at birth by an expert, though commonly it is not appreciated by parents of the child until months have elapsed and the morbid con-

¹ Johns Hosp. Bull., April, 1900, p. 89.

PLATE XIX



Palmar Keratosis, due to Arsenic.



dition has fully developed. In some cases, there is a coincident change in the teeth, hair, and nails. In others there is a history of similar disorders in other members of the family, immediate or remote. In some instances it is congenital and hereditary. Vörner¹ reports the disease as occurring in four generations, sixteen out of forty members of the family being affected. Other instances in which the disease occurred through four generations are reported by Brayton, Decroo, and Pasini.²

In the acquired hyperidrosis cases the nails are often affected and sooner or later etiological factors are evident in the embarrassment of the circulation. The heart, lungs, nervous centres, or general bodily health may be responsible for the keratoma. Sometimes there is marked tachycardia, in others bradycardia; in yet others, the kidneys are at fault. Grave changes in the palms and soles are occasionally associated with desquamative nephritis and albuminuria.

The arsenical and traumatic cases (those due to exposure of the hands and feet in the trades) have an origin that explains itself.

Pathology.—Vörner states that all the layers of the skin involved are thickened uniformly and that cornification is normal in type but excessive. He found no evidence of inflammation. Pasini reports very great increase in the number of sebaceous glands. Other observers describe marked elongation of the interpapillary processes with dilatation of the blood-vessels and the formation of irregular horny masses over the papillæ.

Diagnosis.—The diagnosis of all forms of keratosis of the palms and soles is to be made from eczema, chiefly by reason of the absence of well-marked inflammatory symptoms, of vesicles, and of eczematous patches in other regions of the body. Palmar and plantar syphilides are to be distinguished with great caution. These last may be asymmetrical, especially if of "late" type; may exist where there is often a history of infection or signs of lues; and may often ulcerate. They have also well-defined circinate borders; and the lesions are more often multiple and isolated.

Treatment.—Internal treatment is preëminently indicated in all the hyperidrosic cases; and should be employed to meet the indications present. Abstention from tobacco, coffee, tea, and alcoholic stimulants, is in general demanded. The arsenical cases may be greatly improved by cessation of the medication. Brocq advises the internal administration of sodium arsenate in large doses; but in this connection it should be remembered that cases are reported in which keratosis of the palms and soles has apparently been produced by a long course of arsenic. The local treatment is by prolonged maceration of the parts, followed by shampooings with green soap in substance or tincture, followed by salicylated pastes, plasters, or solutions of salicylic acid in collodion. Mercurial plasters and mercuric oleates may also be used with advantage. Potassium hydroxide in 10

¹ Archiv, 1901, lvi., p. 3 (bibliography).

² Giorn. ital., 1902, xxxvii., p. 318 (bibliography).

to 20 per cent. strength has been applied as a lotion to stimulate the surface. Other formulæ recommended are salicylic acid and calomel, 1 part of each to 20 parts of glycerole of starch; and 1 part each of resorcin, tartaric acid, and salicylic acid, to 20 or 30 parts of the salve-basis.

In 3 cases we have obtained very marked improvement with a few applications of the *x*-rays. In one congenital case, that of a girl, five years of age, a keratosis involving the entire surface of both palms and soles, and so severe as to prevent extension of the fingers and to interfere with walking, disappeared almost entirely after 16 treatments during a period of six months. Eighteen months later the keratosis had not returned.

Prognosis.—In the inherited and congenital cases complete removal of the disorder is accomplished rarely, but by continued treatment the skin can be kept soft and the patient more comfortable. It must not be forgotten that hyperkeratosis of the palms and soles, or of other parts of the body, may terminate in epithelioma.¹

KERATOLYSIS EXFOLIATIVA CONGENITA.²

The shedding of what practically corresponds to the epithrichial layer, occurs in new-born infants and is exhibited in the form of branny desquamation lasting for a week, ten days, or more after birth. From what precedes in the paragraph devoted to the general considerations of keratotic changes in the skin, it will be clear that in some cases the epithrichial layer is not thus normally shed but, as Lenglé has suggested, takes on, as it were, an independent existence and continues in adult years with the production of more or less persistent desquamation and exfoliation.

Under the title "*Keratolysis Exfoliativa Congenita*" Sangster³

¹ Bibliography: Unna, Archiv, 1883, p. 231, report of 2 cases. Hyde, Med. News, ii., 1887, p. 416, 3 cases. Hyde and McEwen, J. C. D., 1904, illust. cases associated with hyperidrosis. Hyde, Morrow's Syst., iii., p. 405. Brocq, Traitement des Mal. de la Peau, 2d ed., p. 376. Brooke, B. J. D., 1891, pp. 335 and 19. Vörner, Archiv, 1901, lvi., 1901, p. 3. Dale, Brit. Med. Jour., 1887, Oct., i., p. 718 (Mal de Meleda). Havorka and Ehlers, Archiv, 1897, xl., p. 251. Besnier, Keratoderma symmetrica erythematosus, Internat. Atlas Selt. Hautkrank., Heft ii., 1887. White, C. J., Keratosis palmaris et plantaris hereditaria, Boston Derm. Club Cutan., 1903, xxi., p. 289. Hallopeau, H., Sur une erythrodermie mycosique avec hyperkératose plantaire et palmaire et peut-être néoplasie initiale, Annales, 1896, s. iii., vii., 522–524, also, Sur un hyperkératose palmaire et plantaire localisée aux orifices sudoripares et sur le rôle des orifices glandulaires dans les néoformations épidermiques, Annales, 1895, s. iii., xi., p. 480–482. Schütz, Tylosis Palmarum in the Adult Independent of Pressure, Archiv, Bd. 59, 1902, p. 57; B. J. D., xiv., 1902, p. 320 (Ueber die vom Druck unabhängige Tylosis palmarum der Erwachsenen). Decroo, Primary congenital and hereditary case of Keratosis of the Palms and Soles, J. des Sci. Méd. de Lille, No. 27, 1903, p. 11; B. J., 1903, xv., 377 (existed in four generations—two brothers, three cousins, one daughter (also grandfather and father and uncle), other members in each generation not affected. Allen, Keratosis of the Palm, N. Y. Derm. Soc., C. G. U., 1899, p. 576. Piffard, A Case of Keratosis (Multiple) of the Palms and Soles, N. Y. Derm. Soc. C. G. U., 1899, p. 373. Audry et Dalous, Hyperkératose circonscrite des doigts chez un syringomyélique, J. mal. cut., 1902, 6s., xiv., 412–415. Ch. Audry, Dyskératose palmaire au cours d'une ichthyose irritable, J. Mal. Cut., 1903, 6s., xv., 566–567.

² B. J. D., 1895, vii., 37 (photographic plate).

and later Rasch¹ have described these conditions, the former in the case of a man 24 years of age in whose case the desquamation began at the third week of life, became universal at the end of the third year, and afterward persisted with constant exfoliation in large sheets. There were also areas of infiltrated skin divided in quadrilations. The palms and soles were thickened and sodden from hyperidrosis with no exfoliation in these regions. The pruritus was severe and there were infected points as the result of scratching. Where the loosened epidermis had been removed, the skin for some hours was blanched; the hairs and nails were unaffected.

Rasch's case was somewhat similar though the skin was reddened, the author suggesting as a title for the disease, *Ichthyosis rubra*. This was evidently one of the types of keratolysis described by the French as lamellar exfoliation of the skin of the new-born.

MAL DE MELEDA.

Mal de Meleda, described by Salli, Hovorka and Ehlers,² Neumann, and others, is a disease recognized on the Island of Meleda off the Dalmatian Coast, in which occurs a congenital keratosis, not exclusively involving the palms and soles, but the lower portions of both extremities. There is some ichthyotic thickening of the skin which also exhibits blackish points supposed to represent the orifices of the sweat-ducts. The odor emanating from the parts is offensive when seborrhœic accumulations also occur. Radcliffe-Crocker believes this endemic affection to be in part due to intermarriages. The supposition that it is a form of leprosy has been abandoned.

POROKERATOSIS (Mibelli).³

(HYPERKERATOSIS EXCENTRICA (RESPIGHI), KERATODERMIA EXCENTRICA, HYPERKÉRATOSE FIGURÉE CENTRIFUGE ATROPHIANTE (RESPIGHI).)

This rare dermatosis was first described by Mibelli, his cases having been recorded in 1893; since that date about two score of patients affected with the disease have been seen in Italy, America, Germany, and Hungary, the observers in these countries being for the

¹ *Derm. Zeitsch.*, 1901, viii., 669; *Abs. B. J. D.*, 1902, xiv., 110 (cited by Crocker).

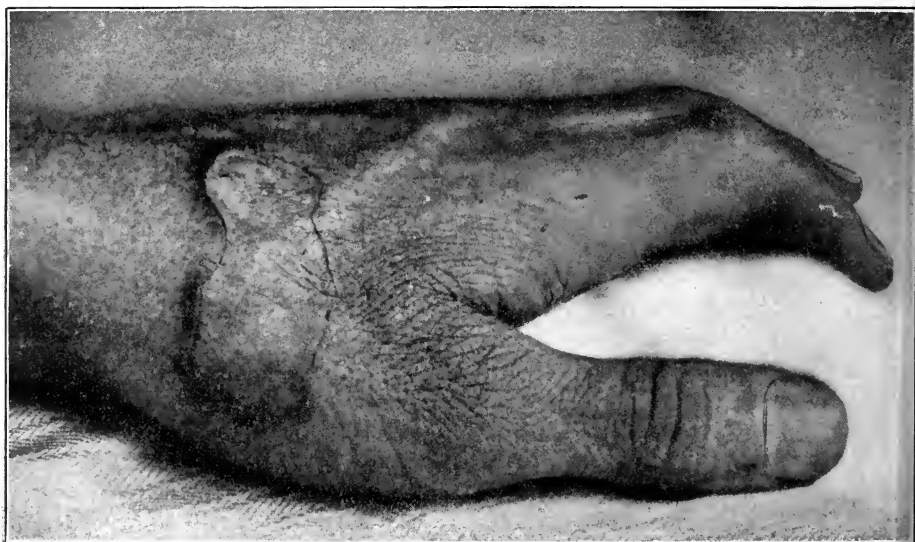
² *Archiv*, 1897, xl., p. 251.

³ Bibliography: Mibelli, *Giorn. ital.*, 1893, p. 313; *Monatshefte*, xvii., p. 417; *International Atlas of Rare Diseases of the Skin*, 1893, xxvi.; Bibliography to date, *Archiv*, 1899, t. xlvii., p. 231. Hutchins, *J. C. D.*, 1896, October. Gilchrist, *J. C. D.*, 1899, April. Wende, *idem*, 1898, November. Aberastury, *Anales del círculo medico argentino*, 1899, t. xxiii. Wolff, *Verhandlungen der deutschen dermatologischen Gesellschaft*, IV. Congress, Vienna, 1899, p. 387. Hartung, *Archiv*, 1901, t. lvi., p. 147. Basch, *Pester medizin.-chirurg. Presse*, 1898, No. 27. L. Nielsen, *Derm. Zeitschr.*, 1903, p. 597. Larrode, Thèse, Bordeaux, 1900. Audebert-Lasrochas, Thèse, Paris, 1902. Galloway, *B. J. D.*, 1901, p. 262. Joseph, *Archiv*, 1897, xxxix., No. 3. Kullak, *Dissert. inaug.*, Berlin, 1901. Heller, *Derm. Zeitschr.*, 1899, p. 691. Heidingsfeld, *J. C. D.*, 1905, January.

most part named in the appended bibliography. In 1905, Mibelli reporting two new cases observed by himself, took occasion to remark that the instances described by Joseph, Heller, and Heidingsfeld were not identical in character with those which he has recorded. The following description is a brief abstract of the features of the disease as described by Mibelli.

Symptoms.—Porokeratosis is an inherited, chronic, and progressive keratoatrophoderma, which persists during life. Its elementary lesion is a definitely defined superficial spot, which is essentially a small keratotic collar, sharply elevated above the general level of the skin like a dike or seam, enclosing a slightly atrophic integument.

FIG. 73.



Porokeratosis showing the furrow running along the top of the ridge, and the atrophic appearance of the skin within the encircling ridge. (Douglass Montgomery.)

The dike or limiting wall is in section, triangular, having a prismatic outline, with a tortuous contour producing more or less sharply bordered figures, yellowish-gray or brownish in hue, horny in character, surmounted by a dry, firm, delicate, projecting crust, which seems to spring from a slender furrow running along the summit of the dike, constituted of a spur rising from the horny layer of the epidermis.

The elementary lesion is this minute horny spur, firm, dry, pointed, and springing from the orifice of a cutaneous gland, about which forms the minute collar referred to above, constituted of slender flat-topped horny lesions which may fuse. As gradual extension of the disk ensues, the central portion becomes progressively depressed. Where the skin is delicate and covered with lanugo-hairs (buttocks, thighs, and legs) the skin of the enclosed area presents only a smooth,

slightly atrophic appearance, the lanugo-hairs being generally absent. Keratosis in these parts is represented chiefly by the dike or wall; there may be, however, minute projecting horny lesions in the central area representing the orifices of the cutaneous follicles.

On the backs of the hands where no irritation has been produced by reason of friction, etc., incidental to the trades and occupations of life, the hyperkeratosis is much more pronounced, the collarette larger, firmer, and more elevated than elsewhere, while the central area is remarkable for its dryness.

As the process extends centrifugally, there is persistence until atrophy occurs of the orifices of the pilo-sebaceous pouches and the sweat-pores. Situations where these features are pronounced are: the face, the scrotum, the axillæ, the pubic region, and the hairy scalp.

On the disappearance of the hyperkeratosis the surface becomes shiny, atrophied in various degrees, and the normal furrows of the skin somewhat more separated. The hairs are usually, not always, absent; and there is more or less peripheral pigmentation.

In such special regions as the face for example where the glands are numerous the atrophic condition is less distinct, the isolated horny projections often absent, and the peripheral collarette much more slender. The appearance then is that of a delicate atrophy of the skin.

In regions where there is external pressure the reverse occurs, for example, over the dorsum of the toes. Here the keratosis is more developed, the atrophy more pronounced. The impression to the eye is then suggestive of a dermato-sclerosis. In the palmar and plantar regions and on the lateral surfaces of the fingers the appearance produced may be that of a soft corn; but the characteristic collarette suffices to establish the distinction.

Etiology.—The causes of the disease are not known. Eleven cases reported by Gilchrist occurred in four generations in one family. The record of other cases indicates clearly that the disease, or the tendency to it, is inherited and, as Mibelli points out, often limited to members of a single family.

Pathology and Histology.—The horny layer in these cases is the seat of a hyperkeratosis the normal epidermis being, especially in the basal layer, increased in thickness; the granular layer is here and there also increased in dimension. At the level of the collarette the hypertrophy of the horny layer is increased and produces the projection from the free surface of the skin, which is its marked clinical feature.

On the inner face of the rete when detached from the corium, throughout the length of the collarette, a crest extends in exact correspondence with that which is elevated above the general level of the surface. In the region of the furrow the epidermis is thin, compressed, and deprived of the granular layer. The horny part which fills the furrow is simply an hypertrophied mass of epidermal cells of

atypical cornification. This is in exact correspondence and continuity with the hypertrophy of the horny layer beneath, the peculiarities of the "dike" and the furrow being wholly due to this arrangement.

Treatment.—The treatment is unsatisfactory. Electrolysis and excision have been followed by comparatively satisfactory results; though recurrence often takes place and in most instances the disease persists indefinitely.

ANGIOKERATOMA.¹

(KERATOANGIOMA, LYMPHANGIECTASIS (Colcott Fox). *Fr.*, ANGIO-KÉRATOME, TELANGIECTASIE VERRUQUEUSE (Brocq), VERRUE-TELANGIECTASIQUE (Dubreuilh).)

Angiokeratoma is a disorder characterized by the appearance of pin-head-sized and larger vascular dilatations, upon which are developed later wart-like elevations. The disease occurs usually on the extremities of individuals subject to chilblains. This affection was described first in 1889 by Mibelli; later, cases of a similar character though differing in many details have been reported by Thibierge, Crocker, Pringle, Joseph, Wisniewski, and others. The cases are rare, and they apparently occur with wide divergence of type.

Symptoms.—The lesions may be first recognized upon the hands, where they resemble ordinary perniones, and are seated on the dorsal aspect of the toes and fingers, especially of individuals who are much exposed to low temperatures or who handle cold substances in the trades, as, for example, those who dress cold beef in winter. Both the palms and the soles may be invaded. We have had under observation typical cases in which the lesions existed exclusively on the scrotum. Other instances of angiokeratoma of the scrotum are on record by Fordyce and others. Here, as over other regions of the body involved, the lesions may be discrete or closely commingled, pinhead-sized and larger translucent, horny-capped, roundish warts, tumors, or nodules, at first pinkish, dull reddish, later purplish in color, leaden-hued, or even chocolate-tinted, interspersed with flat macules (split-pea sized for the most part, having a dark central punctum), which are at first removable by pressure and which eventually persist. These lesions are often mere cutaneous varices. The globoid nodules may be smooth and horny at the surface or be roughened and prickly; they are never scaly. Occasionally pedunculated vas-

¹ Bibliography: Mibelli, *Giorn. ital.*, 1889, xxx., p. 527; *Monatshefte*, 1895, xx., p. 309; *Giorn. ital.*, 1891, 159. Pringle, B. J. D., 1891, iii., pp. 237, 282 and 309 (clinical and histological illustrations, with review of published cases). Wisniewsky, *Archiv*, 1898, xiv., p. 557 (bibliography and cuts showing histology). Crocker, B. J. D., 1891. Mibelli, *Atlas Int. Rare Dis. of Skin*, 1890, f. 21. Thibierge, *Annales*, 1892, 1159. Joseph, *Berl. klin. Woch.*, 1902, 20. Bazin, *Affect. cutan. artificielles*, 1862, 457. Secheyron, *Arch. gén. de Méd.*, 1886, 819. Dubreuilh, *La Prat. Derm.*, 1900, i., 423; *Annal. de la Polyclin. de Bord.*, 1889, Jan.; *Annales*, 1893, 579; *Soc. méd. de Bordeaux*, 1893, May 12. Zeisler, *Trans. Amer. Derm. Ass.*, 1893. Fordyce, J. C. D., 1896, 8, colored plate and 5 microphotographs.

cular tumors may develop. At times the varicosities of vessels are commingled with both spots and nodules, transitional forms occurring in some cases. The arrangement of the lesions is in general irregular and asymmetrical, though there may be grouping. There are no subjective sensations. The affection is regarded as of so little moment by some patients that the lesions have been recognized in examining the skin for relief of another disease.

Etiology.—The patients are commonly young, but a few cases have been reported in middle-aged subjects. There is usually a history of exposure of the affected parts to cold weather or to cold substances as described above. Some of the sufferers from the disorder seem to have been subject to chilblains.

Frohwein¹ considering the case of a woman, 17 years old, who had suffered in the hands and feet especially during the cold seasons of the winter since the seventh year of life, calls attention to the frequent coexistence of angiokeratoma with tuberculosis of internal organs.

Pathology.—The first change is a dilatation of the blood-vessels of the papillary layer to form punctiform capillary varices. The blood-stasis is followed by hyperkeratosis of the epidermal cells. Fordyce describes small spaces filled with blood in the papillary layer of the cutis, and also in the rete. He explains their occurrence in the rete by the supposition that the down-growth of epithelial cells surrounds and cuts off some of the terminal vascular loops in the papillæ. There are, in addition, slight evidences of inflammation in the cutis beneath the lesions, and a marked thickening of the horny layer.

Diagnosis.—Angiokeratoma is to be distinguished from superficial lymphangiomata, by the early age at which the latter first appear, by their location, and by the pseudo-vesiculation which they exhibit, as also by the contents of the lesions. Verrucæ vulgares occur as simple hyperkeratoses, uncomplicated with vascular dilatation.

Dubreuilh limits the term angiokeratoma to the lesions occurring in childhood as a consequence of such exposures as invite chilblains; and excludes from the category all cases of multiple angioma whether keratotic or not, congenital or senile, seated in other regions of the body than the hands and feet. He thus excludes all the scroto-tum cases (Fordyce's and our own) which he terms capillary varices; cases like Zeisler's (pedunculated angio-verrucous tumors disseminated over the body); and Moure's kerato-angiomatous lesions of the vocal cords.

Treatment.—The treatment is by stimulating lotions and liniments, as in pernio, and, when required, by destruction of the vascular warts with electrolysis or galvano thermo-cautery.

Prognosis.—The prognosis is favorable, as the lesions may be made to disappear under proper treatment.

¹ Monats. f. prakt. Derm., 1907, xlii., 349.

KERATOSIS FOLLICULARIS CONTAGIOSA.

(ACNÉ SEBACÉE CORNÉE.)

H. G. Brooke¹ described under this title a rare and apparently contagious disorder occurring in children and occasionally in adults. Blackish and yellowish black macules were symmetrically developed into deeply pigmented papules over the face, neck, the shoulders, and the extensor faces of the arms. From these papules protruded blackish specks, which later resembled comedo-plugs and eventually developed as spike-like filaments. The skin, however, was dry, never greasy, of a dirty shade of color; and the thorny excrescences were attached firmly to the tissue beneath. We have had under observation two young women who exhibited precisely the same features on the extensor surfaces of the arms, forearms, thighs, and legs. Unna divides the pathological symptoms into those due to retention and those due to the formation of horny plugs at the sites of the follicles. The lesions are distinguishable from those of acne and comedo by the absence of sebaceous cells and by their collar of horny lamellæ at the base. The spokes are produced by the energy of the hyperkeratotic process, which pushes the horny plug outside of and beyond the follicle, its upper segment only being concerned in the process. The disease is essentially a hyperplasia of the epithelial cells, the first evidence of the operation of the external cause being apparent in the stratum granulosum, the chief result being declared in the common excretory duct of the pilo-sebaceous conduit. The disease was readily relieved by applications of lard saponified with potassium hydroxide.

HYPERKERATOSIS STRIATA ET FOLLICULARIS.

H. v. Hebra² reports under this title the case of a young woman with isolated epidermal elevations, having a reddish margin, of both superciliary arches, over the bridge of the nose, the upper lip, the throat, shoulders, and arms. The lesions were flat or elevated, isolated or confluent nodules, constituted of heaped-up epidermis, which could be removed without disturbing the papillary layer of the corium. Many were bean-sized, grayish-green elevations, conspicuous over the elbows, with underspreading epidermic cones buried in corresponding depressions beneath, which often bled freely when the cuticular mass was removed. Contrasting with these lesions were striated elevations of epidermis extending either at an angle or along the longitudinal axis of the limb. The disorder was relieved by warm-water and soap baths, followed by resorcin-vapor and salicylated plaster.

PARAKERATOSIS SCUTULARIS.

This name has been given by Unna³ to a rare condition occurring in a vigorous man (first on the scalp), in which thick, somewhat

¹ Intern. Atlas, 1892, vii., Pt. xxii.

² v. Hebra, Intern. Atlas, 1891, v.

³ Intern. Atlas, 1890, i.

greasy crusts enveloped bundles of hairs, the separate filaments having yellowish and horny cuffs that were fused with the crust. Whitish scales and horny cylinders with a perpendicular production were visible over several portions of the face. Upon parts of the trunk were brownish spots, coin- to palm-sized, exhibiting horny cones which projected from the follicular orifices. The cones were covered with horizontally placed scales. Dark-reddish, moist, and shining surfaces were exposed on their removal. Closely examined, the horny cones after removal displayed several hairs which projected, one above another, from each cone, having been extruded from their follicles at different times. The author believes the disease to be allied to Devergie's pityriasis pilaris.

ACANTHOSIS NIGRICANS.¹

(Gr., ἀκανθα, spine; Lat., *niger*, black.)

(KERATOSIS NIGRICANS, *Fr.*, DYSTROPHIE PAPILLAIRE ET PIGMENTAIRE.)

Pollitzer in 1890, and after him Janovsky, Unna, Darier, Spietschka, and after them many others have described under these titles a rare condition of the skin which it seems Crocker first reported in a patient. Nearly fifty cases are now on record, the most corresponding to a relatively fixed type.

Symptoms.—The disease is one commonly strictly limited to a definite region of the body, often symmetrical in distribution, and in all instances characterized by papillary hypertrophy and pigmentation. The regions most commonly involved are the nucha, the mammary, the ano-genital, and popliteal spaces, the axillæ, the hands, the feet, the umbilicus, and the mouth. The color of the patches when fully developed is a deep blackish hue, but in some cases lighter shades of yellow and brown are displayed, often the pigment is somewhat irregularly distributed. All the pigmented areas are more or less thickly covered with agglomerated or discrete tubercles, papillomatous growths, or vegetating masses. In some cases these lesions are so small and thickly set as to produce a mamellonated effect; in other cases, large, broad, sessile or pedunculated tumors spring from

¹ Bibliography: Spietschka, Archiv, 1898, p. 247; C. G. U., 1899, p. 98. Menahem Hodara, Monatshefte, 1905, p. 629; B. J. D., 1906, 18, p. 257; J. C. D., 1905, 23, p. 500; Annales, 1906-7, p. 82. Hodara, Un cas de Acanthosis nigricans précédé de cancer. de la mamelle, Mal. Cut., Juli, 1905; Central., 1906, No. 7, p. 213. P. A. Pawlof, Monatshefte, 1902, 34, 269-279; Archiv, 1903, 64, 461; B. J. D., 1902, xiv., p. 361. Barsky, Wretch, 1898, p. 957; C. G. U., 1899, p. 97. Spietschka, Dystrophie Papillaire et Pigmentaire (Acanthosis Nigricans), Archiv, 1898, p. 247; C. G. U., 1899, p. 98. Frankenstein, Inaug. dissert., Heidelberg, 1904; Monatsh., 1906, 42, p. 247. Hess, Munch. med. Wochensch., Bd. 50, H. 38; J. C. D., 1904, 22, p. 533. Burmeister, Arch. f. Derm. and Syph., 1899, p. 343; C. G. U., 1899, p. 322. Grouven und Fischer, Archiv, 1904, 70, pp. 225-238; B. J. D., 1904, 16, p. 433. Darier, B. J. D., Jan., 1897, p. 27. Janovsky, Internat. Atlas, Selt. Hautkrank., Heft iv. Allen, Discussion—N. Y. D. S., Cutan., 1906, 24, p. 274. Menahem Hodara, Mal. Cut., No. 7, S. 502; Zeitschr., 1906, 13, p. 810. Kuznitzky, Archiv, 1896, Bd. xxxv., p. 3. B. Béron, Archiv, Bd. 59, 1902, p. 387.

the pigmented patch. In well-marked cases, the natural furrows of the skin of the affected part are exaggerated. In yet others, freckles, pigmented warts, seborrhœic warts, or pigmented nævi are scattered over the affected area. In some cases the color is deepest along the lines traced by the veins; and the normal areas of the skin appeared

FIG. 74.



Acanthosis nigricans. (Heidingsfeld.)

to have an unnatural lustrous shimmer. The tongue may be covered with prominent villous growths; a similar condition has been noted over the epiglottis and pharynx. Darier states that at times the entire cutaneous surface may be involved.

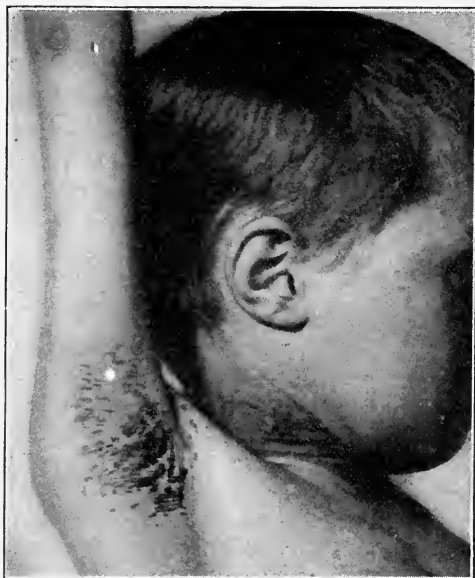
Alopecia, complete or partial, of the hairy scalp and changes in the nails, usually dystrophic in character, are noted. The general health may at first seem unimpaired. In the end, almost invariably, a cachexia develops of grave portent.

Etiology.—It is now generally accepted that acanthosis nigricans of pure type, signifies a cancerous involvement of one or more of the viscera. The liver, spleen, and other of the abdominal organs have been found involved; in a few cases the cutaneous lesions themselves have been the origin of a malignant epithelioma; in one instance reported, the disease began with carcinoma of the female breast. More than half of all the patients thus far reported have been women. Infantile cases occur even as early as the second year of life: but the disease may develop also in advanced years even in the seventh decade. Our few patients have been in early adult life. In one, the entire femoro-crural region was involved in a young man of twenty-six. Darier is inclined to the belief that in childhood a teratoma or benign growth may have operated in the manner of a carcinoma of

the abdominal region in later life, as an irritant of the great sympathetic, provoking thus the change in the sensitive territory.

Pathology.—Histological examination of the tissue in acanthosis

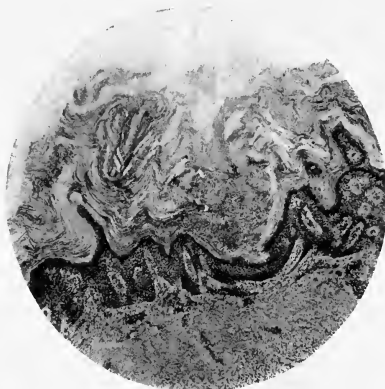
FIG. 75.



Acanthosis nigricans. (Heldingsfeld.)

nigricans reveals: hyperacanthosis giving place to hyperkeratosis, thickening of the epiderm, with preservation of the granular layer; pigmentation of the palisade layer of the rete and two or three ranks

FIG. 76.



Acanthosis nigricans. (Heldingsfeld.)

of cells beyond, irregularly elongated and ramifying papillæ, and no special changes in the connective tissue of the derma or the vessels.

Diagnosis.—The diagnosis lies between papillomata, senile verrucae, seborrhœa nigricans (the superficial character of which is readily determined), ichthyosis, keratosis follicularis, arsenical pigmentation, Addison's disease, and xeroderma pigmentosum. The distinction between all is readily effected by consideration of the special characters of each disease.

Treatment.—The treatment is unsatisfactory. Boeck employed supra-renal extract in capsules.

Prognosis.—In cases of abdominal cancer, the outlook is grave.

CALLOSITAS.

(Lat., *callus*, hard flesh.)

(CALLOSITY, KERATOMA, TYLOMA, TYLOSIS. *Ger.*, VERHÄRTUNG.)

Callosities are acquired superficial, circumscribed, dirty-white, yellowish-white or darker, flattened, thickened, and horny patches of epidermis, dense in structure, usually insensitive, and occurring for the most part in regions of pressure and friction on the hands and feet.

Symptoms.—Callosities vary in size from that of a finger-nail to that of a section of hen's egg, being at times larger; they occur chiefly upon parts of the integument subjected to long-continued intermittent pressure, as the hands and feet; also upon parts stretched over osseous prominences, as those over the ischia. Section of a single plaque shows it to be largest at the centre and least at the periphery. They are commonly encountered among mechanics, carpenters, shoemakers, etc.; among persons wearing no coverings for the feet or ill-fitting shoes (heel, or ball of foot, or big toes), stockings, or surgical apparatus; among workers in metals, acids, or heated substances; and among musicians (harpers, banjo-players, etc.). They are so characteristic of these trades that by their location alone they point in many cases to the occupation of the individual who exhibits them; where they are not too large they are essential to the prosecution of such work. Inflammation may occur in the subjacent tissues and severe dermatitis, lymphangitis, and necrosis result; they may readily serve as foci of cutaneous disease (eczema, psoriasis, etc.). They are produced by such external causes as pressure, friction, chemical agents, and heat. They can readily be distinguished from eczematous, psoriatic, and ichthyotic patches, being always limited to the sites of external contact.

Pathology.—The pathological features of callosities are: marked hypertrophy and compaction of the stratum corneum and thickening of the stratum granulosum, the rete mucosum on the contrary being thinned by the pressure. The papillae are often flattened from the same cause. The corium may exhibit signs of inflammation when the callosity has been converted into a source of irritation.

Treatment.—Callosities require treatment only when they are sources of pain or of discomfort. They may be removed—surgically,

by the knife; chemically, by the destructive action of acids or alkalis; rationally, by disuse of the part to an extent sufficient to interfere with the operation of the cause. When painful they may be poulticed. A nightly soaking of the callus with warm oil, kept in contact with the thickened epidermis during the hours of sleep by a compress of flannel saturated with the same substance, will in the end soften the induration. Other methods of treatment advised are: the continuous application of a 10 to 25 per cent. salicylic plaster or mull (Stelwagon); the salicylated collodion-paint recommended for corns; and the scraping away of the outer layers of the epidermis with a dull knife after soaking in solution of lactic acid, borax, or weak potassium hydroxide solution, protecting the part afterward with zinc-oxide plaster.

CLAVUS.

(Lat., *clavus*, a nail.)

(CORN. *Fr.*, COR, ŒIL DE PERDRIX; *Ger.*, HÜHNERAUGE, LEICHDORN.)

Corns are circumscribed, conically shaped hypertrophies of the horny layer of the epidermis, presenting inferiorly a prolongation, which, being pressed from without inward upon the sensitive papillæ of the corium, excites pain in various degrees.

Symptoms.—Corns vary in size from that of a pea to that of a large chestnut, and commonly are described as “hard” or “soft.” The former are dense and callous, occurring upon those prominent parts of the foot on which the boot, shoe, or gaiter exercises its greatest pressure. Soft corns develop upon the lateral face of a toe in apposition with another, the lesion originating from pressure through the medium of the neighboring toes. It is softer in consequence of exposure to heat and moisture. Corns are often weather-sensitive, being unusually painful before, during, or after the occurrence of storms, and should not be confounded with gouty or rheumatic deposits below the skin. They are seen occasionally upon the palms of the hands and, when occurring upon the soles of the feet, are often the sources of severe distress.

The modern methods employed by the manicure and the chiropodist, often ignorant of the measures requisite to insure asepsis both in their instruments and hands, are often responsible for a series of disorders which are encountered not rarely by practitioners in the larger towns of all countries. Suppuration beneath the conical plug forming the corn is not rare, and not only may eczema, erysipelas, and other inflammatory affections be excited to activity by their procedures, but even a grave lymphangitis spreading the length of the entire extremity may result.

Histology.—Corns are composed of superimposed, and often concentrically arranged, layers of epithelium, between which are found at times minute hemorrhagic extravasations. At the periphery of

the corn the corium is unchanged, but at the point where its central cone is pressed into the deeper structures the papillæ are either atrophied or absent. A corn at the periphery exhibits, according to Unna, a thickening of the prickle- and granular layers. There is a central horny layer, the outermost stratum of which gives evidence of "welding." But the core itself which is composed of compressed masses of the horny layer conically pointed below, exhibits a flattened ridge-net and papillary body. Often the sweat-pores are preserved, and may be traced running dilated and with many windings through the epithelium deeply into the core. The granular layer here disappears, and the general flattening is so great that the margin between the horny cells and the flattened prickle-layer is lost.

Treatment.—Corns, when rationally treated by disuse of the feet, or by the adjustment of properly fitted coverings for the same, will usually fall spontaneously. They are always shed from the feet of the paralyzed. They may be softened by prolonged maceration in water, by poultices, or, best of all, by oil, as in the treatment of callosities. Erasion, dissection, and excision may be practiced, if demanded by an exigency. Where the sufferer necessarily must continue the use of the foot, the simplest and best treatment is as follows: The part is macerated thoroughly for half an hour with water as hot as can be tolerated. Then the projecting callous portion of the corn is removed by gentle cutting or scraping until, as nearly as may be, the surface is level with the plane of the adjacent skin. Then the part is dried, and the entire surface, both of the seat of the corn and the adjacent integument, is covered completely with many narrow, short, and nicely adjusted strips of rubber-plaster. Burgundy pitch melted and painted over the part may be applied as a substitute for the plaster. When the trifling operation and dressing are complete the patient should bear firm pressure over the corn without flinching, and walk with comfort. The plaster remains until it separates spontaneously, which is usually in the course of a few days. The corn is then macerated at night with an oil-poultice, as described above, and the dressing afterward reapplied, usually the second time by the patient. Persistence in this course is followed by complete relief if the coverings of the feet be properly fitted. Caustics are usually unnecessary when there is no ulceration of the hard corn, and are in this situation frequent sources of great distress. They are chiefly valuable in the treatment of the soft variety, but they should always be applied with a skilled hand.

For this purpose acetic acid or the silver nitrate crayon may be employed. The proprietary "corn-salves" sold in the shops commonly contain the ointment of mercuric nitrate, which also in reduced strength is a useful application to the soft variety of corn. The latter should be protected by the interposition of absorbent cotton or wool from contact with adjacent toes.

As a rule, the ringed corn-plasters sold in the shops are inferior to the dressing with the rubber or salicylated plaster, made to cover the entire corn.

Soft corns occasionally require pencillings with the silver-crayon after the outer horny layer is removed. Corns may also be removed by the salicylated collodion employed for warts (*q. v.*).

CORNU CUTANEUM.¹

(Lat., *cornu*, a horn.)

(CUTANEOUS HORN, CORNU HUMANUM. *Fr.*, CORNE DE LA PEAU; *Ger.*, HAUTHORN, HORNAUSWUCHS.)

Cutaneous horns are rare corneous excrescences greatly varying in shape and size, often resembling the similar growths in the lower animals.

Symptoms.—Cylindrical, conical, straight or twisted, angular and otherwise irregularly shaped and sized corneous eminences, commonly single or more rarely multiple, occasionally project from the scalp, forehead, nose, lips, ears, penis, or extremities. The sites of preference are in the following order: the scalp, forehead, temples, nose, lower extremities, male genitals, and trunk. Horns are named from their resemblance to the similar appendages in horned cattle, but they widely differ from cattle-horns, which are always implanted upon osseous tissue. Human horns are formed of dense and massed columns of epithelia, often resting upon prolonged papillæ. Occasionally, on section, they exhibit the concentric arrangement of the epithelia seen in corns, but, unlike the latter, have re-entrant basal depressions into which the papillæ below penetrate. At times they are implanted in a dilated follicle, in which case the glandular elements participate in their formation. At times, also, they represent a corneous transformation of the epithelia which constitute warts. They are seen in all colors, but are often between a yellowish brown and a brownish black, with fissured or wrinkled or longitudinally grooved exterior, like rough bark (Fig. 77). They may be painless or, like other keratoses, become the seat of inflammation in various grades. They may be short or several inches in length (Fig. 78). They may be shed spontaneously never to return, or may shortly reappear. They occasionally develop into epitheliomata.

Brinton² has exhibited an anteriorly curved horn one and seven-eighths inches long and three-eighths of an inch in circumference, removed by him from the glans penis of an elderly patient. Fourteen cases are on record of a similar growth in this situation. In the horn growing from the lower lip of an elderly man exhibited in 1886, at our clinic the growth was longitudinally furrowed, and also at somewhat regular intervals transversely seamed, presenting thus the appearance of the joints of the sugar-cane.

Etiology.—The cause is without question that of the senile wart

¹ For review of the subject, with bibliography, see Marcuse, *Archiv*, 1902, ix., p. 197; and Pasini, *Giorn. ital.*, 1902, xxxvii., p. 475.

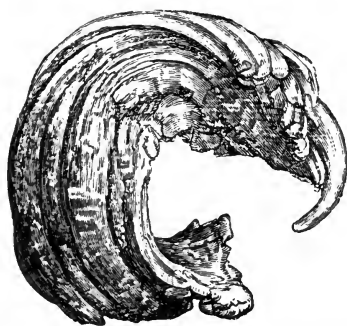
² *J. C. D.*, 1887, vi., p. 272.

for most cases; though, as with epithelioma, horns occur in infancy. They have been recognized as starting from a sebaceous cyst. They develop, if at all, more often after the fortieth year of life, though

FIG. 78.



FIG. 77.



Varieties of cutaneous horns.

occurring in infancy and with slightly greater frequency in women than in men.

Pathology.—Pathologically these hypertrophies are developed first either within a closed atheromatous cyst or from remarkably elongated papillæ of the corium. They are made up of cornified and hypertrophied epidermal cells. According to Unna, they are all papillary and medullated keratomata growing on a circumscribed warty base. The first stage of their development is characterized by a simultaneous acanthosis and hyperkeratosis, dense, epithelial taps reaching toward the corium. In the second stage of horn-formation the keratosis advances and the acanthosis diminishes. Sets of horny wedges sink downward into the epithelial taps and ridges, fill the

spaces between the papillæ, and are capped above by a horny cupola.

Lebert shows that horns develop into epitheliomata in about 12 per cent. of cases. As horns are really metamorphoses of epidermal cells similar in many features to warts, it is not surprising that the two often undergo the change from benign to malignant epithelial

FIG. 79.



Cornu cutaneum. (Heidingsfeld.)

growths. In a few cases horns have developed to an appreciable degree on epitheliomata; but under the microscope this horny metamorphosis on a smaller scale may be recognized in a large number of epitheliomata situated on the back of the hands of elderly men who have been farm-laborers, sewer-builders, or workers in contact with earth.

Treatment.—Horns may be removed by extirpation after softening with alkaline dressings, after which the surface upon which they were implanted should be cauterized thoroughly to insure a failure of return.

Prognosis.—In formulating a prognosis the possibility of an epitheliomatous result should not be forgotten.

VERRUCA.

(Lat., *verruca*, an excrescence.)

(Wart. *Fr.*, *verrue*; *Ger.*, *warze*.)

Warts are overgrowths of clusters of papillæ of the corium covered with thickened and hypertrophied epidermis presenting themselves clinically as cutaneous excrescences; congenital or developing after birth; split-pea-sized to many larger dimensions; sessile or pedunculated; pointed or flat; smooth, rugous, or having a cauliflower appearance, pigmented in various shades of the natural color of the skin; soft, dense, or corneous to the touch. They may develop slowly or rapidly, and may persist for years or disappear without apparent cause. They may be single, multiple, or exceedingly num-

erous; and occur upon the hands, feet, face, scalp, neck, genitals, and other parts of the body. They are usually discrete, but may be confluent and form palm-sized and larger elevated plaques. Fox, of New York, has reported a case in which warts occurred in the lines tattooed on the skin of a young man.

The several names given to the various forms of warts have chiefly a descriptive value.

Verruca Acuminata¹ (*Condyloma Acuminatum*; *Moist or Venereal Wart, Fig-wart*; *Ger., Spitzenwarze, Venerische Warze, Feigwarze, Spitzencondylom*) is a filiform, papilliform, or cock's-comb-like vegetation, developing usually on the mucous membranes of the genitals. They are single or multiple; at times hundreds coexist upon the genitalia and neighboring regions. In size they vary from that of a pin's point to that of a hen's egg, and may be larger. They are usually moist and secreting, frequently being covered with a puriform mucus of exceedingly nauseating odor. The secretion at times desiccates so as to cover the lesion with a thin crust. The warts are often the seat of a very considerable pruritus. They are encountered upon the glans, around the frenum, and over the prepuce of men; and in women about the clitoris, labia, ostium vaginae, and anus. They are usually of a bright-red color in these situations. When occurring upon the integument they are firmer, drier, and exhibit a tendency to luxuriant growth. In rare cases they may be recognized about the axillary regions, the umbilicus, the interdigital spaces of the feet, and even the face. They may cover the side of the chin.

The summit of these warts may be tufted, acuminate, or flattish; on the surface of the skin, unconnected with mucous membrane, they may have the color of the unaltered integument. They are often minute and numerous as well as multiple and large; or they may be single throughout, though, as a rule, they multiply when untreated. Their largest maximum development is observed in negroes, in whose persons they may attain unusual proportions. There was lately exhibited at our clinic a male negro with a compound venereal wart of the penis that was of the size of an orange.

These warts are almost always the result of exposure of the sexual parts to venereal secretions (blennorrhagic, syphilitic, leucorrhœal, etc.), and, though observed in virgins, are decidedly rare in individuals of both sexes of that class. In pregnancy they often attain a large size and rapid development, but, as a rule, disappear when parturition is completed. They are contagious and furnish auto-inoculable secretions. Cocci and bacilli have been recognized in several varieties, thus explaining many otherwise obscure histories.

Verruca Acquisita.—*Verruca acquisita* is a term used to designate lesions developed after birth.

Verruca Congenita is a *linear naevus*. Often first noticed several months after birth, they may be single or multiple, usually the latter,

¹ For bibliography, see Joseph, Mraček's Handbuch, iii., p. 425.

PLATE XX



Congenital Warts.



in which case they are arranged in lines. They are, as a rule, roundish, slightly pigmented, and scarcely larger than split pease.¹

Verruca Digitata.—This is a term descriptive of the form of wart exhibiting finger-like prolongations separable from base to point. Often each separate filament is horn-capped. This type of lesion often occurs as a succedaneum in other affections (*e. g.*, blastomycosis of the skin, syphilis cutanea capillitii, etc.).

Verruca Filiformis.—This variety of wart differs somewhat from the others, not only pathologically, as is noted below, but also in its clinical features. These warts are pointed growths, soft, slender, thread-like, often pedunculated, usually covered with a smooth and apparently unaltered epidermis; they occur upon the face, neck, eyelids, chest, and ears. Kaposi concludes that they are minute fibromata.²

Verruca Dorsi Manus et Pedis (Unna).—This is a nævus with lesions symmetrically grouped upon the dorsal surfaces of the metacarpi of the thumb and index finger. The lesions are flat, round, or polygonal, two to six millimetres in diameter, externally presenting a punctate appearance, occurring in middle or later life, and exhibiting no tendency to spontaneous change. Pathologically they disclose a distinctive thickening of the prickle-layer from the periphery to the centre. They lack many of the characteristic microscopical features of the ordinary seborrhœic wart.

Verruca Glabra is distinguished by its smooth surface.

Verruca Necrogenica is a tuberculous wart, occurring on the hands of persons who have been in contact with tubercle-bacilli, chiefly as a result of handling the bodies of the dead. For details, the chapter on Tuberculosis of the skin should be consulted.

Verruca Plana (*Verruca Plana Juvenilis*³) is a distinct clinical entity; it is flat, smooth, and but slightly elevated. The plane warts may be single, but are commonly multiple, and they usually vary in size from that of a pinhead to that of a small split-pea, but may be much larger. They often are grouped, and may have a polygonal outline, closely simulating the papules of lichen planus. In young people these plane warts are usually small, multiple, often grouped; have the color of the normal skin or are slightly yellowish or whitish, occasionally bluish; and are seen most frequently on the forehead, on other parts of the face, and on the backs of the hands. In older people this form of wart shows less tendency to grouping than in the young, often is pigmented, and may be associated with or form the beginning of superficial epithelial changes.

Verruca Senilis vel Plana (*Verruca Seborrhœica, Keratosis Pigmentosa*).—These warts are small pea- to coin-sized, and larger, smooth, softish growths developed upon the face, trunk, and extrem-

¹ Cf. Nævus Pigmentosus, Nævus Verrucosus, Nævus Unius Lateris, etc.

² See Taylor's observations as epitomized in the chapter on Fibroma.

³ For bibliography, see Joseph, Mraček's Handbuch, iii., p. 518.

ities of persons of advanced years. They are flat, usually pigmented, and have a granular aspect. They are readily separable by the finger-nail, and then are found to rest upon a reddish granular base. As a result of external injury (caustics, traumatism) they may become the starting-point of an epithelioma.

Verruca Vulgaris is the form most frequently seen upon the fingers and hands, as single, multiple, or exceedingly numerous, pin-head-to pea-sized, usually discolored, papilliform excrescences, dense or softish, rapidly or slowly developed. The top of each is commonly grayish, yellowish, or blackish in tint. Exceptionally these warts develop on the borders of the lips, the scalp, the axillæ, and the groins. Warts on the sole of the foot are not uncommon. Hardaway¹ has directed attention to the frequency with which warty growths, callosities, and hyperhidrosis of the feet occur in those suffering from flat foot and Morton's foot and the benefit derived from orthopedic treatment. Upon the fingers an exceedingly annoying site is within or upon the nail-folds and beneath the free borders of the nails, situations often affected in several fingers of both hands, especially in young women.

FIG. 80.



Verruca juvenilis plana.

Etiology.—Most warts are nests of microörganisms of different varieties. The precise cause, however, is unknown; but in early childhood, a period in which warts frequently are encountered, it is reasonable to conclude that they result from external contacts. It is when the child begins to handle everything within reach that they usually first appear, and then about the hands. They are probably

¹ J. C. D., 1906, p. 127.

in a feeble measure both auto-inoculable and infectious. Fox, Allen, and Stelwagon have recognized coexistence in one subject of both warts and mollusca. Jadassohn inserted fragments of ordinary warts from four patients in superficial incisions of the epidermis in six different adults. Out of seventy-four inoculations, thirty-three were followed in from two to six months by the development of warty lesions.¹ Acuminate or condylomatous warts chiefly occur in parts moistened with a blenorrhagic secretion, but unquestionably they may originate from contact with leucorrhœal or pathological, non-venereal discharges from the female genitals. Senile warts are more probably due to obscure changes in the nutrition of the integument. The etiological importance of the cocci and bacilli which many of them furnish cannot be determined at this time.

Pathology.—The verrucous process begins with downward and upward growth of the rete-cells, resembling in this respect benign epithelioma. The granular layer is remarkably thickened, while the greatly hypertrophied horny layer is less compact than normal owing to imperfect keratization of the cells, in many of which the nucleus is still apparent. The descending rete-processes are usually pointed and turn toward a common centre, producing thus a shallow cup-shaped depression in the cutis.

The papillæ beneath the wart are flattened, many being obliterated, except a few at the centre of the base. These hypertrophy, become elongated, and with their dilated vessels form a vascular "core" for the verruca. In the pointed forms the connective-tissue and vascular elements are marked, while the horny layer is but slightly hypertrophied. In verruca plana the chief change is in the rete, the horny layer being but little thicker than normal.

The seborrhœic wart is characterized by a thickened horny layer and hypertrophied rete, with grouped and linear epithelioid cells separated by bundles of connective tissue in the papillary and sub-papillary layers. The coil-glands are fat-infiltrated, as also parts of the rete and cutis (Pollitzer²). In verruca acuminata there is no tendency to cornification. The rete and papillary bodies are remarkably hypertrophied and macular.

Diagnosis.—It is a matter of importance to recognize the fact that many epitheliomas begin as warts; therefore the verruca of those advanced in years should always be examined and treated with a view to this fact. A tendency, especially in the aged, for the lesion to break down into an ulcer should arouse suspicion. Warts on the face and the backs of the hands of the aged are often of this class.

Another class of warts are tuberculous in character, and, whether occurring in the young or the aged, are the result of infection with tubercle-bacilli, a generalized tuberculosis at times originating in these lesions (*vide* Tuberculosis Verrucosa).

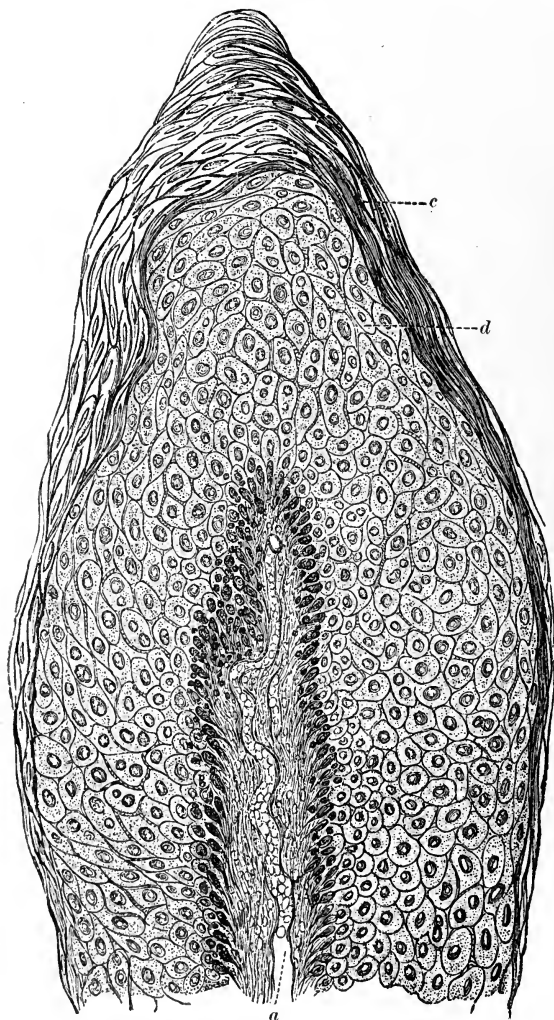
Great care must be had to distinguish the moist variety from

¹ Verhand. der v. deutschen. Cong., 1896, p. 497 (bibliography).

² B. J. D., 1890, ii., p. 199.

syphilitic condylomata. In the latter there is usually a history of contagion with other syphilodermata upon the surface, such as mucous patches, palmar lesions, or papules of the face. Fibroma, or molluscum fibrosum, generally occurs in tumors of greater number, firmer

FIG. 81.



Vertical section of the summit of a pointed wart; *a*, papilla containing vascular loop; *c*, stratum corneum; *d*, hypertrophied rete. (After KAPOSI.)

consistence, and larger size. The tumor of molluscum epitheliale greatly resembles a wart, but the waxy-whitish appearance of the lesion and its dark punctum at one plane or another sufficiently distinguish it. In exceptional cases verruca plana may in shape and grouping closely simulate lichen planus, but the location and history

together with the absence of the typical color, of the varnished appearance, and of the itching, characteristic of lichen planus, will make the diagnosis clear.

Treatment.—Crocker, Colrat, Thin, and other writers still teach that there is an effective treatment of warts by the administration internally of magnesium sulphate in repeated doses, liquor arsenicalis, nitro-muriatic acid, the tincture of thuja, and thyroid extract. Warts may be removed by excision, erosion, or caustics (silver nitrate, alkalies, acids, ferric chloride, corrosive sublimate, etc.). The larger growths upon the genitalia that are often highly vascular may demand the prior application of a ligature when they are pedunculated. Even the slender filiform warts will be found to contain a small vessel in each pedicle that demands cauterization after excision. Ordinary venereal warts require scrupulous cleanliness, deodorization with chlorinated soda, and afterward dusting with calomel or with powders of inert material (fuller's earth, lycopodium, talc) containing 10 per cent. of salicylic acid, alum, or tannin. When warts cannot more readily be removed by the knife or by curved scissors, the Paquelin cautery may be used. The blackened eschar which is left prevents hemorrhage, serves as the best subsequent dressing, and is less likely to be followed by a return of the growth. In some cases it is a useful expedient to transfix the lesion in several directions with the long needles used in gynecological practice, previously dipped in a 50 per cent. solution of chromic acid.

One may also transfix the base of the wart a sufficient number of times with a needle connected with the negative pole of a galvanic battery, the positive pole being connected with the body of the patient by the aid of a moist sponge.

The formula according to which are made several of the proprietary "wart-cures" sold in the shops is as follows:

℞	Acid. salicylic.,	3ss;	2	
	Cannabis Indic. extr.,	gr. v;		30
	Collodii.,	3ss;	15	M.

Sig. To be painted over the wart with a camel's-hair brush.

For small multiple warts Morris recommends the following:

℞	Glycerin.,	3jss;	6	
	Acid. acetic. dil.,	3ijss;	10	
	Sulphur. præcipit.,	3j;	4	M.

For patches of warts Van Harlingen recommends cautiously attacking one part at a time with the following paste:

℞	Pulv. acid. arsenosi,	gr. vj;	40	
	Ung. hydrarg.,			
	Emplast. hydrarg., }	āā q.s. ad 3ij;	āā q.s. ad 8	M.

Glacial acetic acid, carbolic acid, nitric acid, chromic acid, caustic potash, zinc chloride—in fact, the entire list of caustics—have been successfully used in these destructive applications.

Warts may also be treated by painting once daily with a saturated solution of potassium bichromate in boiling water. The liquid is applied cold. The application is painless and leaves no scar (Louvel-Dulongpre). Seborrhœic warts usually are treated with shampoos and cinnabar and sulphur pastes, 1 part of the first, 20 of the second, and 50 of paste. In two cases in our care of numerous and grouped verruca plana in young adults, rubbing the lesions daily with Vlemineckx's solution was followed by their complete disappearance in two weeks.

For warts not requiring operative removal local treatment generally answers well. Those about the genital region often disappear if persistently washed with a solution of tannin in alcohol, 1 drachm (4.) to 3 ounces (90.), after which they are dried and thoroughly dusted with boric acid, or salicylic acid with lycopodium, or burnt alum and rosin, or what is most popular, dry calomel. Alum- and lead-lotions may also be substituted for the tannin and alcohol, and for a time be kept over the parts on a compress.

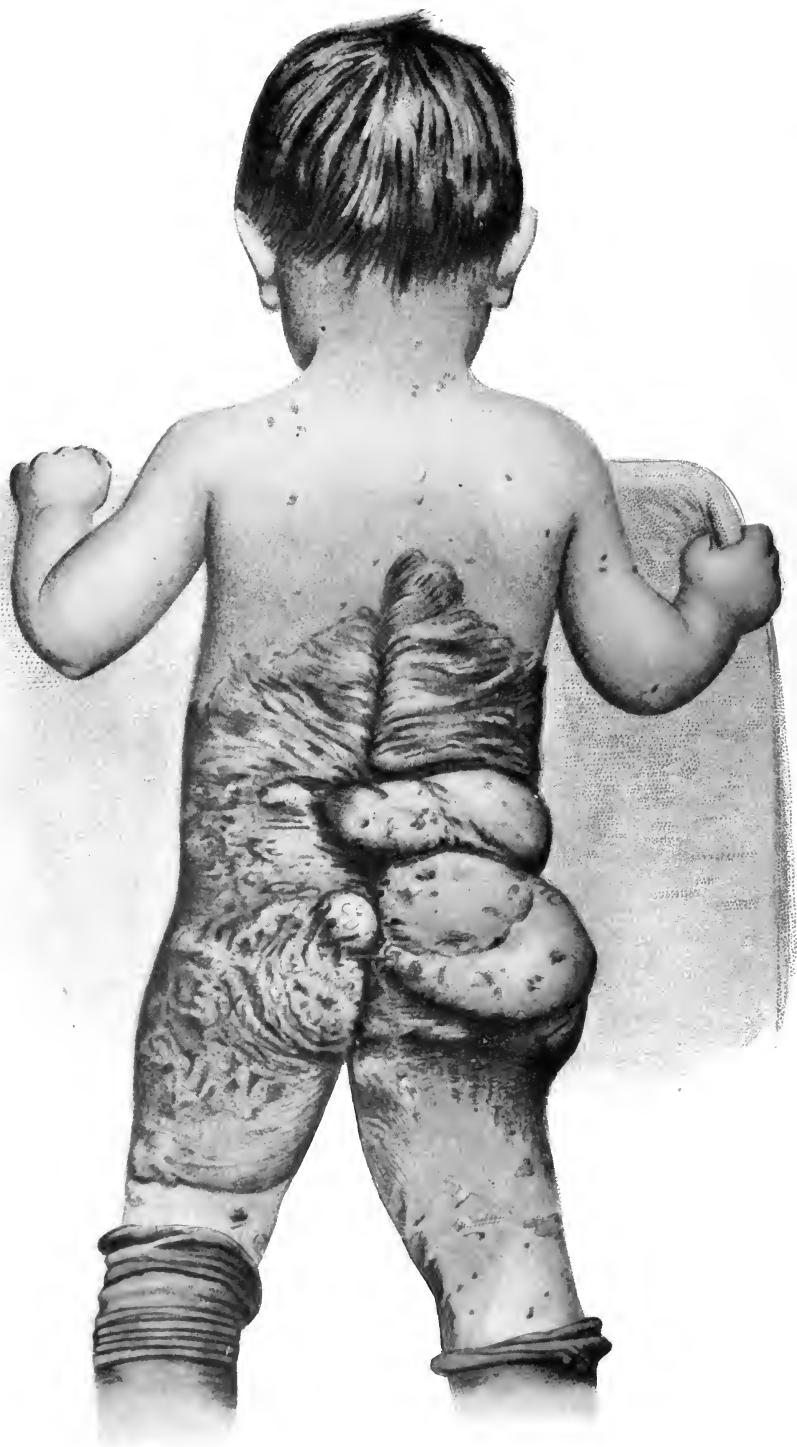
Warts are also removable in some instances by radiotherapy, using a soft tube, after relatively few exposures.

Prognosis.—Warts are benignant growths; in childhood and in early adult life they need not suggest grave sequels. It is far different in advanced years, for, though these excrescences possess even then no malignant character, they are frequent precursors of epithelioma. While it may justly be urged that the early lesions in such cases were really epitheliomatous and not verrucous, the fact remains that many warty formations of apparently benign character do in advanced years, especially when irritated by frequent caustic applications, undergo a cancerous metamorphosis. The tuberculous wart also may become the source of general tuberculous infection.

SYNOVIAL LESIONS OF THE SKIN.

These cutaneous lesions possess importance from a diagnostic point of view. We have observed them in several individuals in whom the exact nature of the disorder had not been understood. They occur in the form of wart-like projections from the skin, pseudo-vesicles, and bullæ, always over the site of bursæ connected with tendons, traversing the small articulations of the hand and foot. They are seen over the metatarso-phalangeal articulations; and in the hand most frequently over the dorsal face of the articulation between the distal and adjacent phalanges of the index-finger and thumb. The first form is that of a roundish, corneous, pea-sized wart with a yellowish centre, of long duration, usually insensitive unless roughly handled. When punctured a syrupy, yellowish, or grumous fluid exudes, which continues to form after repeated puncture. Split-pea-sized vesicles, and bullæ as large as a small coin, often exceedingly painful, are also seen, especially upon the feet, with simply an epidermic roof-wall. Each lesion contains the same thickened, yellowish or whitish fluid,





Nevus Lipomatodes.

occasionally mingled with masses like sago-grains. In every case the contents of the lesions are supplied by a synovial bursa beneath the skin, with which the lesion is either directly connected or in communication by a short sinus. The treatment requires the complete excision or destruction of the secreting cyst-wall.

Sidney Jones and Makins, of St. Thomas Hospital, exhibited several lesions of this character to the London Pathological Society.

NÆVUS PIGMENTOSUS.¹

(Lat., *nævus*, a mask.)

(PIGMENTARY MOLE; NÆVUS SPILUS. *Ger.*, FLECKENMAL
LINSENMAL; *Fr.*, TACHE PIGMENTAIRE.)

Pigmentary moles are circumscribed accumulations of pigment in the skin, developing with and without other tegumentary alteration.

These abnormal congenital pigmentations of the skin vary in color from a light-yellow or chocolate-brown to a blackish hue, and they may be single, or be multiple and very numerous. They vary in size from that of a pinhead to that of the palm of the hand; and are either ovoid or circular in contour, or are so irregularly shaped as to present a fanciful resemblance to lower animals, whence the popular belief as to their origin in maternal impressions. They occur in both sexes, and in all regions of the skin, but especially upon the face, neck, trunk, thighs, buttocks, and external genitals. The term *Nævus Spilus* is applied to those pigmentations which occur in a smooth and otherwise unaltered skin; in later life they may become mamillated and present a growth of poorly developed hair; *Nævus Verrucosus*, to those which are warty, soft or hard, furrowed or smooth, accompanied by hypertrophy of the papillæ, and often presenting a growth of hair; *Nævus Pilosus*, to those surmounted by a growth of shorter or longer, stiff or downy, dark- or light-colored hairs. The so-called "*White Moles*" are similar to those described above, except that the pigmentation is slight or apparently wanting.

LINEAR NÆVUS (MORROW).²

(NÆVUS UNIUS LATERIS, NÆVUS VERRUCOSUS, NÆVUS NERVOSUS, ICHTHYOSIS CORNEA, ICHTHYOSIS LINEARIS NEUROPATHICA, PAPILLOMA NEUROPATHICUM UNILATERALE.)

Moles may be, when multiple, symmetrically or asymmetrically developed upon the surface of the body.

In a case reported by me³ there were multiple monolateral pigmentary nævi distributed over the left side of the trunk in the

¹ For studies of the different forms of nævi, and full bibliographies, see Möller, *Archiv*, 1902, lxii., pp. 55 and 371; and Riecke, *ibid.*, 1903, lxx., p. 65.

² N. Y. Med. Jour., 1898, lxxii., p. 1.

³ Chicago Med. Jour. and Exam., 1877, xxxv., p. 377.

course of the intercostal nerves, and in such a manner as strongly to suggest to the eye their correspondence in site with the lesions of zoster of the same region. De Amicis¹ had previously reported a

FIG. 82.



Nævus pilaris et pigmentosus.

somewhat similar case. Many other cases have been recorded in which pigmentary and verrucous naevi, consisting of variously sized and shaped lesions, were arranged in lines or streaks, usually on one side only of the body, and often along the course of one or more nerves. Selhorts² and Thibierge³ have reported cases of this type in which involvement of sebaceous glands produced acneiform lesions.

Etiology.—Moles occur in both sexes either as congenital lesions or developing later in life. In both cases they may persist without change or undergo degenerative transformation at a later period. The cause of the linear arrangement of these lesions is undetermined. The explanations which have been invoked are that they follow nerves or vessels, or the lines of skin-cleavage, the lines bounding the nerve-territories (Voigt), the embryonic sutures, or the metameres of the body.⁴

¹ Lo Sperimentale, 1876.

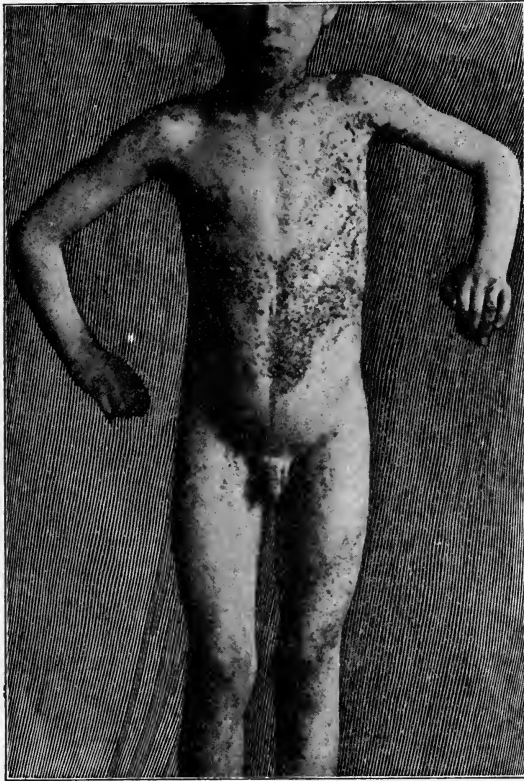
² B. J. D., 1896, viii., p. 419.

³ Annales, 1896, s. iii., vii., p. 1298. For full review of the subject, with bibliography, see Werner and Jadassohn, Archiv, 1895, xxxiii., p. 341; also Strasser, Archiv, 1903, lxxx., p. 21 (bibliography). D. W. Montgomery gives a list of 48 titles under which linear nævus has been described, J. C. D., 1901, xix., p. 455.

⁴ Cf. D. W. Montgomery, loc. cit., and Balzer and Alquier, Arch. gén. de Méd., 1901, clxxxvii., p. 717.

Nævi seem to occur with equal frequency in the two sexes, and though they usually appear at birth or soon after, they are sometimes first seen at puberty or even later in life. It is possible that they may be acquired after birth, as claimed by some authors; but it is

FIG. 83.



Nævus linearis.

much more probable that such presumably acquired cases are instances of rapid development from minute congenital pigmentary moles.

The tendency of pigmentary nævi, after attaining full evolution, is to persist unchanged for a lifetime. Their increase in persons of tender years is occasionally characterized by a relative rapidity of growth. A pilary nævus upon the cheek of an infant may extend over nearly double its original area in the course of two years. In adults an increase in the size of these growths is unusual but does sometimes occur. Degenerative changes are possible. In the young there may be spontaneous gangrene or rapid necrosis following slight injury of the nævus. In older people there may be a malignant transformation into carcinoma or pigmented sarcoma.

Pathology.—In pigmentary moles there is an increase of pigment in the deeper layers of the rete cells and a deformity of the rete pegs; they are dumb-bell shaped or they present other unusual forms. In the derma, nævus cells can not always be demonstrated.

In the warty and hairy moles, there are in addition to these findings, peculiar cells which present the appearance of embryonic epithelium; they are situated in the derma and they extend downwards,

FIG. 84.



Naevus pigmentosus (unilateral distribution).

being arranged in rows. These nævus cells have been extensively studied in recent years. Some believe they are epithelium and others that they are endothelium cells.

In linear nævi there is no uniform histopathology; in some cases there is a hypoplasia of the glandular organs of the skin and in others the papillæ, vessels, or prickle-cells are enlarged or imperfectly formed.

Treatment.—Pigmentary moles very rarely spontaneously disappear. Their removal may be accomplished by excision, or by destruction with caustics, with the Paquelin knife, or with the needle by electrolysis. The last-named method is applicable only to the smaller and more superficial growths of this class. Fox¹ calls attention, in connection with this subject, to the need of passing the needle no deeper than the epidermis, sufficiently deep merely to "blister the surface of the black spot." The electrolytic removal of hairs from

¹ Electricity in Removal of Superfluous Hairs, etc., Detroit, 1886.

hairy moles usually results in obliteration of the lesion. Treatment by the use of carbon-dioxide snow and liquid air (*q. v.*) is often highly satisfactory. Radiotherapy has been employed by us in a few cases of pigmentary nævi with slight improvement in one case.

FIG. 85.



Nævus unius lateralis.

Prognosis.—Pigmentary moles, when not removed artificially, rarely increase in size, thus not adding to the disfigurement they occasion. The possibility of the metamorphosis of these lesions into malignant growths after the attainment of advanced years is the chief element of gravity.¹

GIANT NÆVUS.

(ICHTHYOSIS HYSTRIX.)

This group includes all cases in which the nævus affects extensive areas of cutaneous surface. The classical picture of this develop-

¹ Cf. Whitehead, Johns Hopkins Hosp. Bull., 1900, xi., p. 221 (full bibliography); and Whitfield, *loc cit.*

mental defect involves the loins and upper part of the thighs, presenting the appearance of swimming-drawers. The same affection may involve the entire trunk or any segment of the same. In rare instances the *nævus* affects the entire integument excepting the palms of the hands or the soles of the feet and the face ("porcupine-man"). *Nævus mollusciformis* and *lipomatodes* belong to this group. The affected area is pigmented, hairy in some cases, and frequently harsh, uneven, thickened, and divided irregularly by clefts; it may resemble the skins of animals or reptiles.

ICHTHYOSIS.

(Gr., *ἰχθῦς*, a fish.)

(FISH-SKIN DISEASE, XERODERMA. *Ger.*, FISCHSCHUPPENAUSCHLAG; *Fr.*, ICHTHYOSE; *Ital.*, ITTIOSI.)

Ichthyosis is a congenital cutaneous deformity, characterized by a dry, harsh, and scaling condition of the skin, associated with abnormal cornification of its external layers.

Symptoms.—**Ichthyosis Simplex** (*Xerosis; Xerodermia*).—The earliest and mildest form of ichthyosis simplex is the xerodermatous condition.

The sole symptoms are cutaneous. The skin of the body, in some regions more than others but at times universally, is to the touch dry, harsh, rough, and destitute of natural moisture and unguent. Closely inspected, the skin-surface is seen to be scaly, exfoliation being of the character described as *furfuraceous*, and often inelastic and leathery. In some cases the hand passed briskly over the surface of such a skin will cause separation of scales in a scanty shower; in other cases the flakes of epidermis are attached more or less, and the clothing of the patient is not, as in some forms of psoriatic and pityriatic disease, covered with epidermal scales. In brief, here is not in progress a catarrh of the horny layer, as in some of the other disorders named, but merely an unusual keratinic transformation of the elements of the layer.

The parts chiefly involved are the extensor faces of the extremities, as also the hands, feet, forearms, and legs; but all parts of the skin may be involved, including the scalp, face, temples, cheeks, and even the lips.

The disorder is met with in all grades, from the mildest physiological dryness suggestive of so-called "goose-flesh," to that state in which the face only indicates an abnormal condition of the skin. In some cases the xerodermatous papillæ project as in *keratosis pilaris*. The color of the integument in well-marked cases is of a dirty-yellowish or dirty-brownish shade, suggesting an unwashed condition, and in extreme cases, usually those of older patients, the skin becomes rather deeply pigmented. The affection is seen in both sexes and all ages, being a congenital condition, the first appearance of which is indi-

cated clearly only after variable periods of time after birth. Red-haired individuals perhaps furnish the larger number of well-marked cases. The general health is unaffected. Before puberty the affection in northern latitudes will often be inappreciable in summer and distinct in winter. As maturity is reached, however, the condition may become permanent.

A child affected with what appears at first to be merely xerosis may exhibit an extreme type of ichthyosis before puberty, while an-

FIG. 86.



Ichthyosis hystrix.

other will go through life, the xerosis of his childhood remaining practically unchanged.

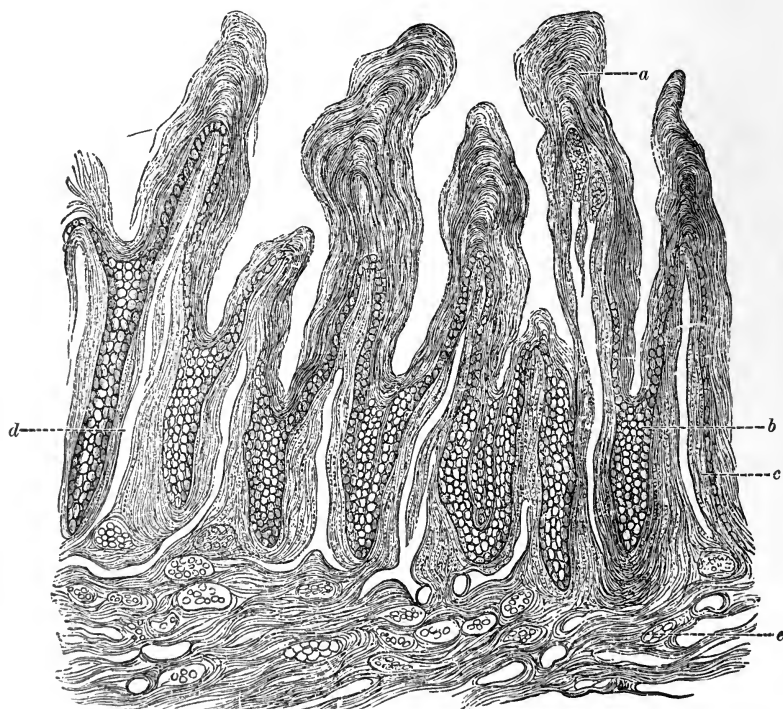
The xerodermatous skin both of children and adults is commonly sensitive to irritating agents, and is often the seat, especially in severe winter weather, of itching, inflammation, fissures, etc.

In a grade of ichthyosis more advanced, the scales are massed, forming grayish and whitish, polyhedral elevations or plaques, regu-

larly outlined and closely set, especially upon the extremities and certain portions of the trunk. It is the regular setting of these horny plates which has given the malady its familiar title, "fish-skin" disease. The scalp in almost all cases is dry and scaly and the hairs like those recognized in long-standing seborrhœa sicca of the same region. The so-called "*Alligator-skin*" represents an extreme condition of cornified integument, inelastic, discolored, and transformed into a cuirass covered with thick plates like those of the saurian. Elsewhere the scaliness described above may be present, but in a more marked degree. Follicular keratosis is a common feature. Variations occur, in consequence of which the plaques, bordered distinctly by the natural lines and furrows of the skin, are even depressed, centrally or completely, or they assume darker shades of color—viz., brownish and greenish-brown.

Ichthyosis Hystrix.—This is a term which formerly caused great confusion because giant nævus was classified under this head. At

FIG. 87.



Ichthyosis hystrix, vertical section; *a*, masses developed from the stratum corneum, *b*, cones formed by the rete; *c*, hypertrophied papillæ with dilated vessels; *d*, dense connective tissue of corium, exhibiting numerous vessels transversely divided. (After KAPOSI.)

the present time it is used exclusively to designate those cases of ichthyosis in which there are present circumscribed patches of spinous excrescences.

Ichthyosis Congenita¹ ("Harlequin" *Fœtus*, *Keratosis Universalis Congenita*).—This exceedingly rare deformity occurs as an intra-uterine modification of the skin of the fœtus, which usually is brought into the world as a non-viable monstrosity. The skin is represented by a thick, horny cuirass, deeply furrowed and resembling plates of armor. Large flakes of corneous epidermis, but partially attached to the corium, present their broad free edges to the outer world. The ears, eyelids, and lips usually are wanting, being replaced by corneous folds suggesting in appearance the corresponding features of a mummy. The fingers and toes resemble talons and claws. Death commonly occurs in the course of a few days from inability to secure nutrition by the act of sucking and from imperfect development of other organs than the skin. Bowen² believes that some of these deformities are due to a persistence of the epitrichial layer of the fœtus.

Sherwell³ describes a case of congenital ichthyosis of unusual interest from the fact that at the time of the report the infant had lived to be more than five months old, and seemed to be gaining in strength and improving in the condition of the skin. No history of heredity or of a family tendency to deformities of the skin could be obtained.

Viewing ichthyosis as thus exhibited in various manifestations, it is seen to be a congenital deformity rather than a disease. It may be partial or general, though usually the latter, with intense manifestations over the extremities, especially over the extensor aspects; and relative immunity of the face, the axillæ, the groins, the flexor aspects of the limbs, the palms and soles, the glans penis, and the prepuce. The deformity is rarely visible at birth, but usually becomes apparent before completion of the first year of life. It is manifested first in the regions of election named above—i. e., over the elbows and the knees—and here it may for some years only be apparent in northern latitudes in winter, disappearing almost wholly in the summer season. When maturity is reached, the deformity has been known to disappear temporarily under the influence of intercurrent disease (variola). One patient is said to have regularly cast a slough of his integument in the autumn. The general health usually is unimpaired.

Ichthyosis is accompanied by insignificant subjective sensations. The skin, indeed, of these patients may be free from the eczematous and other complications of the less diffuse keratoses. In four ichthyotic patients who were syphilitic there was a decided tendency to the production of lesions of the mucous surface without cutaneous efflorescence. The extensor usually are implicated more than the flexor surfaces of the extremities.

Etiology.—Ichthyosis is unquestionably a congenital condition,

¹ For bibliography, see Neuman, *Archiv*, 1902, lxi., p. 163; and Lenglet, *Annales*, 1903, s. iv., iv., p. 369.

² *J. C. D.*, 1895, xiii., p. 485.

³ *Ibid.*, 1894, xii., p. 385.

though its first manifestations are apparent only during the second year of life. Crocker describes an acquired case in a septuagenarian. It is said to be invariably hereditary, but this should be accepted with some reserve. One ichthyotic patient, married to his cousin, had by her five children free from cutaneous disease. None of his parents or grandparents was affected similarly. The disease occurs equally in both sexes, in all lands, and in persons of all social ranks. It is liable to aggravation in cold climates and during the season of winter. The general vigor and development of patients thus deformed are, as a rule, unimpaired. Kaposi says: "The cause appears to be a local anomaly of the nutrition of the skin, especially involving its epidermic and fatty elements."

Thost¹ describes ichthyosis occurring in four generations. According to the ascertained genealogy, the ancestor first known to have suffered from this affection had five male children who inherited it, while one girl and one boy were spared. One of these affected subjects had five children, of whom three males showed the anomaly, while one boy and one girl remained free. Another brother, of the second generation, had five male and three female children; of these, four boys and two girls became affected. One of the latter (third generation) bore four children, of whom three girls inherited the disease, while the fourth, a boy, escaped. It appeared that the affection always showed itself within a few weeks after birth, in the form of a roughness of the palmar and plantar surface. With the growth of the patient the condition constantly increased in severity, the epidermis shedding in large shreds, until the disease reached its maximum by the fourteenth year. There was a marked disposition to excessive sweating, particularly in the diseased localities; the sensibility of the skin remained normal. Microscopic examination showed in addition to hypertrophied papillæ, great development of the sweat-glands, with marked thickening of the ducts. Treatment failed to give more than partial relief.

In the Molucca Islands and some other isolated regions ichthyosis, on account of its unusual prevalence, has been regarded as an endemic affection; but instances of this kind are readily explained, without referring to climatic influences, by the operation of heredity and inter-marriages.

Pathology.—In the mild forms Unna describes an immediate formation of the horny layer from the rete without the intervention of keratohyalin. The result is a complete cornification, the horny cells being homogeneous and containing no nuclear remnants. In this respect the hyperkeratosis is unusual, and contrary to the belief of many observers that cornification is impossible without the intervention of the keratohyalin of the granular layer. The rete is thinned more from an atrophic condition of the cells than from an actual diminution of their number, though this does occur sometimes, so that only one or two layers of cells cover the papillary tips. The lymph-spaces

¹ Inaug. Diss., Heidelberg, 1880; *Centralbl. f. Chir.*, 1881, xiii., p. 154.

are also very small. The extremities of both the rete-pegs and papillæ are broad and flattened and their necks narrowed, so that they suggest a dove-tailed appearance. The coil-glands possess a swollen epithelium and a widened lumen resembling their excretory ducts, which exhibit less functional activity. The collagenous fibres are thickened at the expense of elastic, fatty, and lymphatic structures, and there may be a chronic low grade of papillary and perifollicular inflammation without plasma-cells and with only a few mast-cells. The follicle-mouths either were dilated with a broad horny plug, or were closed, retaining the plug in the dilated neck. In severe forms is noted a proliferating rete with reappearance of the granular layer and a deeper dipping down of horny substance, the cutis containing many plasma- and mast-cells. In these severe forms there is less superficial exfoliation, the dryness characteristic of the mild forms is wanting, and the condition is readily transformed into the clinical crusting type known as "ichthyotic eczema."

Ichthyosis congenita is believed by Bowen¹ to be due to a persistence of the epitrichial layer of the fœtus. Wassmuth² has published the results of a study of a case of ichthyosis congenita (hyperkeratosis diffusa congenita). He found the changes limited almost entirely to the epidermis, the cutis showing only an insignificant chronic inflammation of low grade. As compared with normal skin, the papillæ were much more numerous, broader and flatter, with greater irregularity in form and size. The layers of the rete were thickened and the cells of the epithelial pegs assumed a spindle form. Nearer the surface they became polygonal. A granular layer could be made out definitely only on the scalp. The horny layer varied in thickness on different portions of the body, but averaged two hundred times thicker than normal. The sweat-glands were greatly increased in number, but otherwise normal. Deformities of the sebaceous glands were caused sometimes by keratinization of the follicle-mouths. The hairs grew quite normally except for their deformed shape, caused by the thick and dense horny layer.

Diagnosis.—Ichthyosis not only presents features which are so characteristic as to be unmistakable, but also those which can well nigh perfectly be portrayed in plates. In this respect it differs from a long list of cutaneous maladies.³

Whenever necessary in the establishment of a diagnosis, aid of an important character can be obtained in the history of the disease and in recognition of the absence of the lesions and lesion-sequels exhibited in the exudative and scaling affections heretofore considered. The most conspicuous characteristic of ichthyosis as distinguished from psoriasis, lichen ruber, and pityriasis, is the absence of inflammatory phenomena.

Treatment.—The younger the patient applying for relief the larger are the chances of improvement and of possible recovery. Ich-

¹ J. C. D., 1895, xiii., p. 485.

² Beiträge zur path. Anat. und allgemein. Path., 1899, p. 19.

³ Cf. portrait of the ichthyotic skin in Plate F of Duhring's *Atlas*.

thyosis hystrix of mature years is far less manageable. Internal treatment is valueless, though authors still recommend sulphur, thyroid extract, antimony, and jaborandi.

External treatment is directed to softening, macerating, or anointing the skin, and, so far as practicable, to preserving it in a softer state. This softening is accomplished by frequent baths, alkaline, vaporous, or combined with the use of soap or green soap, and generally followed by an anointing with vaselin, dilute glycerin, or lard. The French, after the removal of the denser layers of the horny plates with the aid of soft soap and water, anoint the body by friction with glycerolate of starch. Almond-, cod-liver, or linseed-oil, benzoated lard, lanolin, or even better, salicylated cocoanut-oil may be used after the bath. Stelwagon and others recommend the addition of resorcin to the unguents in the strength of 3 to 10 per cent. Sulphur and ichthyol salves have also been praised. Only by the most assiduous perseverance is a desirable result obtained and permanently secured. In the severe hystrix varieties the most annoying projections and rugosities may be removed by excision, by the Paquelin knife, or, less preferably, by the aid of caustics.

Subcutaneous injections of $\frac{1}{4}$ grain (0.016) of pilocarpine have been practised in ichthyosis, in order to induce sweating, with a view to maceration of the skin. Van Harlingen recommends the following for use when the epidermis begins to shed after the application of soft soap:

R Potass. iodid.,	℥j;	1 33
Ol. pedis bubuli, }		
Adipis, }	āā 3ss;	āā 15
Glycerin., }	5j;	4 M.

Anderson recommends the wearing of pure vulcanized India-rubber garments, a method of treatment too exhausting for all cases.

Taking a general survey of the therapeutic management of ichthyosis and its results, the course to be advised for the majority of patients is clear. With but few exceptions, the subjects of this deformity are either entirely relieved or greatly better during hot weather and in moist atmospheres. Marked exceptions to this rule, however, occur. Under these circumstances, and having regard to the essential fact that the deformity is lifelong in duration, patients should always, when practicable, select for permanent residence a climate most conducive to the comfort of the skin. There is no step which the ichthyotic patient can take comparable in value with the selection of a suitable environment.

Prognosis.—Having in view the facts set forth above, it will be clear that in no case can a favorable result be anticipated with a respect to a "cure" of the deformity. Treatment, persistent, prolonged, and properly directed, in connection with suitable climatic influences, may do much to improve the condition of the skin.

ŒDEMA NEONATORUM.¹

(SCLERODEMA [Soltmann].)

Œdema of the newborn is the same as that of adult life. It presents special clinical features because of the undeveloped character of the infant's skin (Luithlen²).

It is characterized by the occurrence of an indurated tumefaction of the skin, most noticeable in the lower extremities of infants affected with impaired circulation.

Œdema and sclerema of the newborn have long been confused. The distinction between them was first well established in 1877, when Parrot, under the title *Athrepsie*, first described with clearness the morbid condition now recognized as œdema neonatorum.

Symptoms.—The disease, which is of exceedingly rare occurrence in America, is observed in infants prematurely brought into the world or at term, and of feeble vitality. Between the first and the third day after birth the child is found to be drowsy and difficult to waken, with the posterior and other parts of the thighs and legs, the hands, and the genital organs pallid, cold, livid, and retaining the impress of the finger as do œdematous tissues in general. At this point recovery may ensue, but in severe cases the œdema spreads always more markedly in the lower portions of the body, and the skin becomes violaceous red, deep yellowish, or dirty looking. As the disease advances the integument becomes more and more difficult of indentation. Meanwhile the little patient becomes more drowsy, its respirations fewer, its cry weaker, and its temperature lower. Death may ensue from a pulmonary complication, from diarrhœa, or from any intercurrent disorder. Usually the child passes into a state of coma. When recovery ensues the œdema becomes less marked and the indurated skin more and more impressible. A few days, in satisfactorily managed cases, suffice to restore the patient to a condition of health. In some instances the œdema begins in other portions of the body than those named; and in cases there is a marked febrile reaction.

Etiology.—The recognized causes of the malady are prematurity of delivery, cardiac feebleness, syphilis, exposure to severe cold soon after birth, poor hygiene, atelectasis of the lungs, and malnutrition from inability to take the nipple. Blacker³ describes a case, seemingly typical, in which there was no evident etiology. The child at five weeks was perfectly well and properly nourished, but still retained the hard œdema of the buttocks, thighs, part of the arms, and chest. The mother was always well, and the pregnancy, labor, and puerperium presented no unusual features.

Pathology.—There is ordinary œdema present. The skin is not the same as that of healthy infants born at term but presents the microscopical characteristics of a 6 to 8 months old fœtus.

¹ Full bibliography for œdema neonatorum and sclerema neonatorum is given by Soltmann in Eulenburg's Real-Encyclopædie, 1899.

² Mraček, Handbuch der Hautkrankheiten, Bd. iii., p. 201.

³ B. J. D., 1898, x., p. 87.

Diagnosis.—The distinction between œdema and sclerema neonatorum is not made without difficulty, the disorders greatly resembling each other. In sclerema the joints and particularly the jaws are immobile; the disease is likely to be generalized; the induration of the integument is greater; and there is no tendency to an œdema chiefly marked in dependent parts of the body, as over the lower limbs. The color of the skin in the two disorders may be nearly the same. The pitting on pressure of the swollen skin is highly characteristic of œdema neonatorum. Scleroderma does not occur in children before the close of the first year.

Treatment.—The treatment is that of scleroderma neonatorum.

Prognosis.—The prognosis is grave, nearly 90 per cent. of the affected perish; but with proper treatment recovery may occur when œdema is not generalized.

SCLEREMA NEONATORUM.¹

(Gr., σκληρός, hard; νέον, new; γεννάω, to bring forth.)

(SCLERODERMA NEONATORUM; SCLEREMA OF THE NEWBORN. *Fr.*, SCLÉRÈME DES NOUVEAU-NÉS; *ATHREPSIE*. *Ger.*, FETTSKLEREM.)

This disease is not to be confused with œdema neonatorum, from which it is distinct. It was described first by Underwood in 1784,² and is an affection of extreme rarity. It is a peculiar form of coagulation of the subcutaneous fat tissue accompanied by dryness of the skin so that very little fluid exudes when it is incised.

Symptoms.—At birth, or between the second and the tenth day after, the lower limbs of the child assume a livid or whitish-yellow appearance, occasionally suggesting the hue of wax; and they become of a leathery consistency. This condition spreads gradually over the lumbar region, the dorsum of the body, and the chest in front and behind, and in the course of a few days may involve the entire integument excepting the palms, soles, and scrotum. When pressed upon with the finger the skin produces the impression of half-frozen tissue; the face suggests a cold and rigid mask; the thighs in their sockets and the arms in the shoulder-joints are immobile. Usually there is somewhat less firmness of the abdominal integument. The taking of the nipple, deglutition, and even the opening of the oral orifice are effected only with great difficulty, and eventually become impossible. The respirations are shallow and imperceptible; the pulse in well-marked cases is imperceptible at the wrist; and the thermometer in the rectum is not raised to the lowest register of the ordinary clinical instrument. There is often no cry.

There may be a coincident icterus; and often sprue has been observed in the mouth before the declaration of well-marked symptoms.

¹ For full discussion of the subject and bibliography, see monograph by Luithlen, *Die Zellgewebsverhärtungen der Neugeborenen*, Vienna, 1902; also Mraček's *Handbuch*, Bd. iii., p. 193.

² *Diseases of Children*, 1784, p. 76.

The congenital patients are often stillborn. The majority of subjects of the disease perish before the ninth day. Diarrhœa is usually present.

Etiology.—Normal infant fat contains less fat acid than in adult life, hence it presents a higher coagulation point. Weakly premature infants have even less fat acid in the adipose tissue, except in the palms and soles, hence loss of water caused by diarrhœa precipitates coagulation of the fat tissue. The scrotum contains almost no fat.

Pathology.—The microscopical examination of the skin shows a normal epidermis, the dermal bundles are pressed together and the fat tissue contains an abundance of fat crystals.

Treatment.—The treatment of both œdema and sclerema neonatorum is by elevating the body-temperature (in an incubator, wrapping the entire body in wool, warm water-baths, etc.), and by improving the nutrition in every possible way (sterilized milk and stimulants by the stomach-tube, through the nose or pharynx).

FIG. 88.



Chronic hereditary trophœdema.

The body may also be well rubbed with warmed oil or camphorated alcohol. Brocq suggests friction with the warm hand from below upward.

Prognosis.—The prognosis is grave; in rare instances when the sclerema has been partial, recovery has ensued.

CHRONIC HEREDITARY TROPHÆDEMA.¹

(DYSTROPHIE ŒDEIMATEUSE HÉRÉDITAIRE [Meige].)

The condition described under the above titles is a white, solid, indolent, and persistent œdema of the lower limbs occurring as a rule

¹ Nouvelle Iconographie de la Salpêtrière, No. 6, 1899, p. 453. (Abs. B. J. D., 1900, xii., p. 372.)

in different members of a family for several generations. We have had three typical examples of the disorder under observation and treatment. Its etiology is obscure and its therapy unsatisfactory.

SCLERODERMA.¹

(Gr., σκληρός, hard; δέρμα, the skin.)

(HIDE-BOUND SKIN, DERMATOSCLEROSIS, CHORIONITIS, SCLERIASIS, SCLEREMA ADULTORUM. *Ger.*, HAUTSCLEREM; *Fr.*, SCLÉRODERMIE.)

Scleroderma is a condition in which the skin is affected with a circumscribed or symmetrical, variously tinted induration, exhibited at times in spots, streaks, bands, or patches, often associated with telangiectases of the part involved.

There are three fairly distinct variations of the process, the symmetrical, circumscribed, and digital. They merge in rare instances.

Symptoms.—Diffuse Symmetrical Scleroderma.—The skin-symptoms of the disease may slowly or rapidly be evolved, and preceded by prodromic pains of a rheumatismal character, or by singular cutaneous sensations (pricking, tingling, formication), or by muscular cramps, and neurotic sensations. In some instances also, there are vesicles, blebs, scales, local hyperidroses, or losses of sensibility in the skin which is about to become the seat of the disorder.

With and without these prodromic features the skin and subcutaneous tissue, chiefly of the upper portion of the body, become symmetrically involved either in a gradually increasing induration or in an obscurely defined œdema of a firm character which at first pits under strong pressure with the finger, but later becomes as indurated and tense as hard leather. The integument is usually exceedingly difficult to pick up between the finger and thumb, and is shining, smooth, waxy, or of alabaster-like hue; in other cases it is of a dirty-yellowish, grayish shade. The line of demarcation between the sound and the affected integument is indistinct but as the disease affects the subcutaneous tissue as well as the skin there is often a peripheral extension of the indurated area underneath the healthy skin. The onset of the disorder may be acute, rapidly involving the body-surface, or the sclerodermatous change may be insidious in its progress, affecting one region only and thence slowly spreading to others, or being arrested after any grade of advance has been attained. This is the stage of infiltration, and when pronounced, it is not to be mistaken for any other condition. The face may be, both to the eye and the finger, mask-like, immobile in features, and expressionless. The lips are then stiffened and opened with difficulty; the eyelids are similarly but much less severely involved. The back of the neck may be firm; the chest, shoulders, and arms may be either immobile or movable with difficulty; the ribs are often bound down so firmly

¹ For complete bibliography, see Luithlen, Mraček's Handbuch, Bd. iii., p. 128.

by the cuirass of leathery integument that respiration may be impeded seriously. The temperature is not changed, and sweat may or may not be exuded over the affected areas. The abdominal surface is relatively spared. This condition may come on insidiously, and may require years for its complete evolution; at other times the progress is rapid and the evolution is even subacute in type. Often the upper extremities are so involved that the fingers resemble curved talons; the wrists lose their flexibility, the forearms their usefulness. So extreme is the helplessness of some patients that they require to be dressed, washed, and fed, even when able to travel with relative comfort.

The lesions are accompanied at times by other subacute symptoms, such as subcutaneous tubercles, eczema, erysipelas, canities, ani-

FIG. 89.



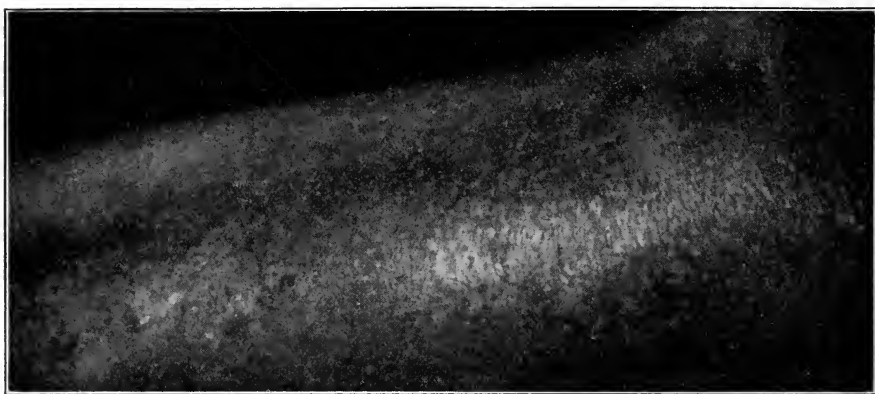
Generalized scleroderma of long duration, with resulting ulcers.

drosis, zoster, and acne. The mucous membrane of the mouth and the vulva in women may be affected often without grave changes in the skin adjoining.

In the later or atrophic stage of the affection the œdematous or infiltrated areas undergo induration and contracture. The skin becomes then more and more tightly stretched and thinned over the un-

derlying structures, and it is no longer possible after drawing the finger over the surface to produce a yellowish-white tracing of its route that disappears as the circulation slowly returns along the line. When this condition is reached, the atrophic skin becomes dry, scaling, fissured, or even ulcerated; the wrinkles of the face disappear; the muscles waste considerably, thus reducing a limb several inches

FIG. 90.



Scleroderma occurring in patient with morphœa guttata.

in circumference; the teeth may fall; the fingers permanently be flexed into the palm or the forearm on the arm. When the condition becomes to this extent grave, the patient, who before seemed to enjoy a fair degree of health, suddenly experiences rheumatoid pains and neuralgias, or exhibits other signs of constitutional impairment; and intercurrent visceral disorders gradually bring on a marasmus which in some of the reported cases has ended with renal, cardiac, or pulmonary symptoms.

Circumscribed Scleroderma; Morphœa (Gr., *μορφή*, a blotch); *Keloid* (of Addison).—Circumscribed scleroderma, or morphœa, is characterized by the occurrence of one or of several discrete, well-defined, firm, and smooth points, patches, lines, or bands, that are often slightly elevated or depressed, and surrounded by a delicate violaceous or lilac-tinted halo, the involution of which may be followed by macular, punctate, or striate atrophy of the skin.

This form of scleroderma was once held to be rare. It is, however, more commonly under observation than is usually believed. French authors distinguish between the variety displayed in plaques and that occurring in bands. Some forms of the latter variety are better described as *lineæ atrophicæ*.

Patches of morphœa commonly begin as rosy or violaceous macules, which irregularly extend in area from finger-nail-sized to larger patches, either with relative rapidity or with slowness. In a variable period of time the centre of each patch becomes whitish, while the peripheral portions of the plaque retain their peculiar shade of color.

There is thus formed a roundish or oval or irregularly outlined area, rarely larger than a dinner-plate, with a central portion slightly deepened or somewhat elevated, infiltrated and "lardaceous," or flattish, and near the level of the adjacent skin. The blanched centre has often the hue of old ivory; later, this may be commingled irregularly with a flattened streak or band, distinguished with difficulty from scar-tissue. These patches may be single or multiple; in the latter event they are arranged, as a rule, along the line of distribution of the cutaneous nerves of the trunk, along the inner faces of the thigh, more often on the lower than over the upper extremities, and asymmetrical in most cases. When the tissue is pinched between the thumb and finger it at first gives the impression of stiffness and hardness; in the later stages of the disease the skin may be so atrophied over the region involved that it is impossible to make this test. The surface is dry and smooth, or, when very carefully inspected, is seen to be traversed by exceedingly delicate lines. In some instances the plaque is dotted regularly with depressed points resembling the patulous orifices of sebaceous glands of the face in certain cases of acne, the

FIG. 91.



Morphea guttata.

slightly discolored, minute, funnel-shaped orifices contrasting thus with the dead-white hue of the patch. In other cases this appearance of dotting or picking out of the surface is more conspicuous at one part than another, being, for example, well shown at an advancing border, with a dead-white, depressed centre, or at both extremities of a long oval.

The border of typical patches is characteristic. It is made up usually of a narrow zone having a pinkish, lilac-tinted, or violaceous hue, which, when closely viewed, is seen to be constituted of a plexus of fine vessels. The zone may be wanting wholly, as is well shown in some cases in which the temple is involved; the border further may be present in such degree as to be fully as conspicuous as the whitish central area. In a patient presenting a palm-sized patch over the sacrum, together with a few multiple spots on the side of the neck (a portrait of the same having been made in oil), the flame-like, violet-shaded areola extended for several inches on one side away from the disk, and one of the larger vessels of which it was constituted could be seen at a distance of several feet from the patient. Purplish and even blackish hues have at times been recognized in the halo by other observers.

As a rule, there are few subjective phenomena; in some cases itching, tingling, pricking, and other sensations are experienced. The variations observed in this affection are as numerous as they are striking. In some cases the patches closely resemble scars; in others there is marked pigmentation, diffuse or circumscribed; in yet others the capillaries traversing the patch constitute a distinct network of predominant symptoms; in still other cases, usually of long continuance the surface of an entire limb may be converted into tissue presenting a dull-reddish area in which new vessel-formation and sclerotic integument are distributed equally. The disease may be extensive or be limited to one or a few small spots. The names: *Maculosa*, *Nigra*, *Lardacea*, *Alba*, *Plana*, *Atrophica*, etc., are merely descriptive of clinical features, and are becoming obsolete.

Between the several types of scleroderma noted above are to be found instances which it is difficult to assign to the one class or the other. Some are mixed forms in which diffuse scleroderma is developed in one part of the body and a circumscribed form in another; in other cases numerous morphœa plaques are distributed symmetrically over the body or develop a generalized symmetrical scleroderma. As a rule, the symmetrical forms occur most extensively over the upper part of the body; while the more frequent unilateral plaques of morphœa affect in greater proportion the lower limbs. Often the symptoms of the disease resemble at the outset those described as characteristic of œdema neonatorum, with pitting of an œdematous surface under pressure. Great variation has been noted as regards the presence, absence, or increase of sensibility. Sweat and sebum may or may not be secreted from the affected patches.

The course of the disease is usually chronic. Many patches after reaching an average degree of extension advance no further. In yet other cases the progress continues through life, or the serious phases of diffuse scleroderma in advanced grade are exhibited.

The sites of election of the disease are the face, the sides of the neck, the chest, the abdomen, and the extremities, though any region of the body-surface may be involved. Multiple patches may be dis-

Figure 10



Figure 11



posed symmetrically or asymmetrically in different regions, and on different sides of the body.

In the generalized forms, whether symmetrical or not, there may occur serious complications from visceral disease (cardiac, vascular, or renal) due in part to interference with the function of large areas of the skin. Arthritis is not infrequently a concurrent disorder. In some cases the mucous surfaces are involved. In other cases there are organic changes in the viscera as well as sympathetic disturbances of function. Some of the visceral muscles have been recognized as involved in scleroderma.

According to Besnier and Doyon, pigmentation is one of the most important of sclerodermatous symptoms. Beside the pigmented dots visible over the sclerosed patches, there often exists a species of chloasma in the form of bronzing, diffuse or in irregular islets, over the neck, shoulders, and elsewhere. These pigmentations are often interspersed with whitish patches of vitiligo.

The course of circumscribed scleroderma is either chronic, lasting for from one to ten years or more; or subacute, with evolution accomplished in a few days and an almost equally rapid involution; or atrophy of skin, subcutaneous tissue, and muscle may slowly or rapidly follow, and result in the production of attachments to periosteum or in deformity due to contracture. Ulceration may ensue, and in a few instances has occurred early in the disease. Atrophy of bone is an exceptional result. In yet other cases absorption of the material constituting the plaque is effected without sequels of any sort, few, if any, traces of the process remaining.

The band-form of circumscribed scleroderma usually occurs in ribbon-shaped elongations stretching along a limb in its longitudinal axis, or over one-half of the face. Most of these cases are distinguished by the occurrence of either an elevated ridge or furrow, or (what is not very rare) an elevated ridge with a furrow on one side. The median line of the forehead is the commoner site of this anomaly on the face; over the trunk it is best displayed on the chest. As noted above, some of the cases collated in this category are instances of *lineæ atrophicæ*.

The affection only recently known as **White Spot Disease** (*Morphœa Guttata*) was first described as a clinical entity by Westburg;¹ subsequently cases were reported by Johnson and Sherwell,² McCleod, and others.³ In all ten cases have been observed. Johnson pointed out a case presented by Montgomery before the American Dermatological Association at its meeting in Chicago in 1901, as an example of this dermatosis. Subsequent observation demonstrated that it was a case of morphœa. The histology and similarity in clinical manifestations convince us that all the cases of this group constitute a peculiar clinical form of morphœa.

¹ Monatsh., 1901, xxxiii., p. 355.

² J. C. D., 1903, xxi., p. 302.

³ Ibid., 1907, p. 1.

The eruption occurs mostly on the anterior surface of the chest, and on the neck and shoulders. The most striking feature of the eruption is the color or rather absence of color. The plaque is chalk-white or snow-white. The lesions are split-pea sized, they may exhibit peripheral extension clearing in the center and attain the size of a dollar. Coalescence of lesions may occur. These patches are irregular in outline and frequently show at the margin slightly projecting points or ridges suggesting those seen in keloid. Linear arrangement also occurs. The smallest lesions are pin-head sized. The largest lesions are covered with a dry glistening epithelium which wrinkles readily like atrophic scar-tissue. To the eye and in the photograph the lesions appear elevated, but on palpation the elevation is found to be slight or absent. The lesions are sharply defined and a few of them are bounded by a narrow faint hyperæmic zone. Continued observation shows that the lesions undergo a distinct atrophy, the epidermis is thin, parchment-like, and slightly depressed. There are no subjective symptoms. The tactile sense is absent over affected areas, plaques of typical morphœa may be present in distinct locations.

Sclerodactylia.—This is a special form of scleroderma affecting the extremities, especially the feet. The disease is apt to begin in childhood and progress steadily but slowly through life. It affects the tips of the toes and fingers at first, and gradually extends upward, involving finally the entire toes and fingers, feet and hands, ankles and wrists, legs and forearms, or it may affect only the lower or upper extremities symmetrically. The affected skin is tightly bound down to the subjacent structures so that it can not be drawn into folds, and it presents a reddish, shiny, glazed appearance. The stiffness of the skin interferes with the motion of joints to such a degree as to render the affected parts useless. Finally ulcers form on the ends of the digits; they persist and sometimes they become epitheliomatous. Amputation of digits is necessary in some cases. Occasionally distant areas of scleroderma are present.

Hemiatrophia Facialis.—Severe grades of the disease are noted by several authors, in which to a varying extent, the surface of the lateral half of the face has been involved. Here not only the subcutaneous tissue, but also the aponeuroses, periosteum, and bones may participate in the atrophy, a fact well illustrated in the case of Robinson's patient.¹ In this instance there was also a distinct sclerodermatous lesion on the face of one thigh.

Etiology.—About three-fourths of all cases occur in women. The young and middle-aged are generally the victims of the disorder, though cases are reported not only in the first year of life but in advanced years. The predisposing causes of the affection are: rheumatism and the climatic changes to which rheumatism is most often

¹ Amer. Jour. Med. Sci., 1878, lxxvi., p. 437.

attributed; all neurotic states due to emotional influences, grief, anxiety, etc.; traumatisms by friction, blows, and direct injuries of nerves; blisters; exposures to the direct action of the sun; and obscure disturbances of the nervous centre that are difficult to appreciate. In one case, a young woman with a series of circumscribed patches along the inner face of the right thigh, could scarcely endure the fatigue of exposure of the part while an oil painting was made of the disks; another case was that of a muscular blacksmith, who exhibited a large plaque of morphea over the trunk. Scleroderma has occurred as a complication of Graves' disease, and in association with Raynaud's disease, lepra, Addison's disease, and other morbid states.

The possibility that in some cases syphilis may be responsible for the vascular obliteration that obtains in scleroderma, has been suggested by several observers, nor are therapeutic results lacking for the establishment of such an etiological factor.¹

The etiological importance of the nervous system is too obvious to require demonstration. This fact is much more distinct in the localized manifestations of the disorder, in which a region supplied by a single nerve or traversed by a nervous trunk is solely involved. Harley, Schwimmer, and others have recognized cardiac and gastric disturbances; Westphal and Eulenberg, central and peripheral changes in the nervous system; Heller demonstrated in one case closure of the thoracic duct. Bancroft² repeatedly recognized filariæ in large numbers in the blood of a young girl in Australia who was affected with a characteristic scleroderma. Atrophy and other changes in the thyroid gland have been noted by Hektoen,³ James,⁴ Uhlenhuth,⁵ and others.

Pathology.⁶—The confusion which has existed in relation to the question of the identity of scleroderma and morphea is due to various causes. By several authors similar symptoms are described under each of the two names; and the symptoms detailed as peculiar to each are occasionally seen either simultaneously or successively in the same individual.

Microscopical examination of the structures involved in the disease has proved unsatisfactory. The connective tissue of the skin has been found, according to Kaposi, indurated and thickened; its elastic fibres multiplied at the expense of the panniculus adiposus; its muscular tissue hypertrophied; the pigment in the rete and corium increased; the sweat-glands dilated; the lumen of the blood-vessels diminished, and their walls ensheathed in accumulations of what he terms "lymphatic cells."

¹ Cf. Whitehouse: Paper on this subject presented to the Amer. Derm. Assn., June 3, 1909.

² Lancet, 1886, i., p. 380.

³ Centralbl. f. allgem. Path. u. Anat., 1897, viii., p. 673.

⁴ Scottish Med. and Surg. Jour., 1899.

⁵ Berlin. klin. Wehnschrft., 1899, xxxvi., p. 207.

⁶ For a histological study of the circumscribed forms, with bibliography, see Zarubin, Archiv, 1901, xiii., p. 188.

The nature of the pathological process in scleroderma is unknown; no characteristic changes in the nervous centres have yet been appreciated. In the generalized form the two vascular systems, the sanguine and the lymphatic, exhibit within and about the walls of vessels embryonic cells which become converted into fibro-plastic bodies. This change produces in parts an increase in the tunica media until it is twice its normal thickness. The lumen of the vessels is thus obstructed and at times obliterated, indicating that the essential process is an endarteritis obliterans, inducing, in the areas to which each twig of vessels is distributed, an exsanguinated state with a surrounding hyperæmia. The latter accounts for the peripheral halo of the circumscribed forms of the malady. That there is at the same time lymphatic obstruction is clear, with, either from the one cause or the other, an overproduction of connective tissue and elastic fibres in the areas of involvement. The corium is commonly hypertrophied, at least in the papillary layer; while the subcutaneous tissue and panniculus adiposus are proportionately thinned; and even at times, as suggested by the clinical features noted above, may wholly disappear. The pigment commonly vanishes from the prickle-layer; the coil glands at first are dilated, and later may disappear when the atrophic stage is reached. In the late circumscribed forms the papillæ of the corium may also fall into atrophy, and the superior vascular plexus of the corium may undergo obliteration by thrombosis (Crocker). The compression of both glands and vessels is supposed to account for the final sclerotic and cicatriform condition of the advanced cases.

Diagnosis.—In vitiligo there is an entire absence of all structural cutaneous changes and the skin has a characteristic milky-white color, the hairs of the part being also blanched. Both the pigmented macules and atrophic patches of lepra are remarkable for their anæsthetic or hyperæsthetic symptoms, and their coincidence with, or sequence from, other readily recognized symptoms of the disease, such as tubercles, bullæ, ulcers, and involvement of the hairs, nails, eyes, and other organs.

In sclerema and œdema neonatorum the age of the patient would serve to distinguish the disorders from scleroderma. In *cancer en cuirasse* (papillary cutaneous carcinoma), chiefly of the skin of the breast in women, but encountered elsewhere, the resemblance to scleroderma is striking; and eminent surgeons have confounded the two. In both affections the skin, especially that of the thorax, is converted into a dense leathery cuirass, but the distinction is made as follows: first, the carcinomatous condition of the skin may be secondary to a cancerous change in the breast or nipple, in which case the doubt is readily removed; second, if primary, the firm, isolated, and deeply tinted nodules of cancer are readily distinguished, projecting from the dense peripheral cutaneous infiltration; third, the œdema and lymphangitis associated with cancerous involvement are most often unilateral, and are limited very distinctly to the arm

on the side of the body most seriously involved; fourth, the line of demarcation of the cancerous change, while indeterminate on one side, is usually at the edge of advance distinguishable by tongue-like erythematous prolongations of a dull-reddish hue; lastly, the tendency to ulceration, the coincident and resulting cachexia, the possible axillary adenopathy, and the relatively rapid and fatal result in cases at all liable to be confused with scleroderma, point severally to the truth.

In ichthyosis the congenital history, the presence of ichthyotic plates over the affected surface, and the general conservation of the health of the patient suffice to identify the disease.

In progressive lenticular melanoderma (*angtoma pigmentosum et atrophicum*) the melanotic condition of the skin, in connection with warts, tumors, ulcers, and limitations of the disease to the exposed parts, suffice to distinguish its character.

Treatment.—In the management of symmetrical or generalized scleroderma the influence of climate should be considered. More improvement is secured for these patients after removal to a dry equable climate than can be obtained elsewhere. If they must remain under unfavorable climatic influences, the body should be well protected by woollen, over muslin, silk, lisle-thread, or balbriggan undergarments; and while an outdoor life is desirable, such exposure should always be avoided in unfavorable weather. Internally cod-liver oil, the ferruginous tonics, and the nutrients generally are often indicated, as well as a roborant and generous diet. Thyroid extract has given good results in a small percentage of the cases in which it has been tried. Phillipson¹ reports relief of severe diffuse scleroderma by the internal administration of salol in doses of from 2 to 3 grammes daily. Hebra² reports good results in three cases from intramuscular injections every second day of 10 minims of a 15 per cent. alcoholic solution of thiosinamin. The employment of potassium iodide, arsenic, mercury, and other remedies, such as lithium benzoate, sodium bicarbonate and salicylate, and the alkalies, supposed to be indicated by the rheumatoid symptoms, have been alike praised and condemned by men of eminence on both sides of the Atlantic. Remedies of the reconstituent order should always first be employed and no resort be had to others save in emergency.

The local treatment is by baths, massage, galvanism, alternate hot and cold douches, or the actual cautery over the spinal column. Following the daily salt-and-water or alkaline bath of a temperature suited to the season of the year and the physical condition of the patient, inunctions with cod-liver oil, lanolin, lard, or vaselin, neat's-foot oil slightly scented, or other simple oil or ointment, may be used. To these may be added with advantage in many cases 2 to 10 per cent. of the oleate of mercury or of ammoniated mercury or salicylic acid. In morphea Brocq employs electrolytic puncture as in the treatment

¹ Deutsch. med. Woch., 1897, 33.

² Archiv, 1899, xlviii, No. 1.

of hypertrichosis. Mercurial plasters are applied in the intervals of each sitting. We have employed radiotherapy in circumscribed scleroderma without satisfactory results.

Prognosis.—Symmetrical diffuse scleroderma, well treated in young subjects, usually results favorably without impairment of the general health. When atrophic changes occur the skin may recover its suppleness and pliability, but this cannot be assured. Deformity in either event may complicate an otherwise favorable issue. In a proportion of cases the disease becomes so extensive and severe as to produce a fatal marasmus; more frequently death results from intercurrent disorders.

In circumscribed patches (morphœa) the majority recover without serious consequences; the few go on to sclerosis of subcutaneous structures and consequent deformity. In the most of the simpler cases the disease from first to last seems to have but a local significance.

ACROMEGALY.¹

(Gr., *ἄκρος*, extremity; *μεγάλη*, great.)

Acromegaly is a disorder involving several organs of the body and incidentally the skin.

Symptoms.—Transitory swellings due to vaso-motor changes affecting the face and hands often precede for some time the classical manifestations of the disorder, which include cephalalgia, rachialgia, and paræsthetic symptoms suggesting hysteria. These are followed by characteristic thickenings of the bones of the hands and the feet, spreading at times to the foot and the leg, and involving also the face, especially the under jaw. In well-marked cases the under incisors project beyond the line of the teeth; the maxillary, malar, and occipital bones are thickened; the nose becomes long and broad; and the under lip, ears, tongue, and larynx, are deformed by thickening. The fingers are large, blunt-pointed ("drum-stick deformity"), and tipped with nails that appear smaller than normal in comparison with the bulbous digits. The so-called "hexagonal face" is thus produced. In connection with these symptoms there may be interference with articulation due to thickening of the tongue, a rough sound to the voice (from laryngeal changes), motor disturbances, and exophthalmos.

The skin and mucous membranes are often the seat of changes. In the skin there may be pigmentation, sclerosis, hyperidrosis (often coincident with polyuria), hypertrichosis, and the formation of keloid at points of trivial traumatisms. The nails are thickened, flattened, and grooved. The subcutaneous fat often is increased. At

¹ For bibliography, see Marie, *Rev. de Méd.*, 1886, vi., p. 297; Marie and Marinresco, *Trans. Derm. Cong.*, Berlin, 1890; Souza-Leite, *De l'Acromégalie*, Paris, 1890 (abstr. of 49 cases); Collins, *Jour. Nervous and Mental Dis.*, 1893, xx., p. 48 (bibliography); Arnold, *Virchow's Archiv*, 1894, cxxxv., p. 1 (with list of cases published since 1890). Shallcross, *Phil. Med. Jour.*, 1901, vii., p. 771; and Kuh, *Jour. Amer. Med. Assoc.*, 1902, xxxviii., p. 295 (full bibliography).

times there is an almost characteristic engorgement of the skin of the cheeks, which taken together with the altered contour of the face described above, furnishes a classical picture.

MYXŒDEMA.

(Gr., *μίξα*, humor; *οίδω*, to swell.)

(CRETINOID ŒDEMA, CACHEXIA STRUMIPRIVA, CACHEXIA THYROIDEA. *Fr.*, CACHEXIE PACHYDERMIQUE.)

This disorder was first described by Sir William Gull¹ in 1873; and it has since been studied, both abroad and in this country, by many observers.

A complete description of the disease and a *résumé* of literature are found in the report of the Clinical Society of London for 1888, and in Murray's elaborate contribution to the same subject, in the *Twentieth Century Practice of Medicine*, vol. iv., 1895. The report embodies the results of the researches of a committee—including Ord, Horsley, and others—specially appointed by the Society to investigate the subject.

Symptoms.—The disease occurs in both acute and chronic manifestations, usually after the fortieth year, and in women more often than in men. It may, however, first be noticed in childhood.

At the outset there is observed a gradually occurring persistent and remediless anæmia, succeeded in turn by mental hebetude, sluggishness of body-movements, and a characteristic change in the integument. The skin becomes dry, rough, yellowish, waxy, translucent, and firm, and refuses to pit on moderate pressure. The surface involved is commonly the seat of a fine furfuraceous desquamation, the mucous membranes often participating in the morbid process. In the cheeks there is usually perceptible a brawny redness; defined at times as a sharply circumscribed, pinkish flush, due to distention of the minute capillaries, extending quite to the lower eyelids, which may, as in Ball's cases, be wrinkled, boggy, and swollen. The eyes, for this reason, seem smaller than natural and more widely separated. In consequence of the swelling and immobility of the features the facies is characteristic: the broad, thick nose; swollen, pendulous, or even everted lips; expressionless eyes; and leathery cheeks, producing upon the observer the impression of a mask. The skin of the other regions of the body participates in these changes, the backs of the hands, for example, becoming wrinkled or distended, the palms dry and fissured, the feet participating in the same morbid process, the hair falling in nearly 90 per cent. of cases even to the production of extreme baldness, the nails becoming discolored, grooved, and cracked, and the teeth often carious, fragile, or wholly lost. The

¹ Trans. Clin. Soc., London, 1874, vii., p. 170. See, also Hun, Amer. Jour. Med. Sci., 1888, p. 196 (notes on 150 cases in literature), and later reports by Adami, Trans. Fourth Cong. Amer. Phys. and Surg., 1897 (review of subject and bibliography), and Murray, Lancet, 1899, i., pp. 667 and 747.

mucous membrane of the mouth (gums, palate, pharynx) becomes tumid and fungous.

In the triangles at the side of the neck, and also at its back, are "bolsters" of fat. The hair of the head becomes harsh and scanty; alopecia may be complete. Pigment-alterations readily occur; moles increase in size; and the general tint of the skin may vary from that of dry parchment to the hue of Addison's disease. The gait is waddling and uncertain. The thyroid gland atrophies. Anæsthesia is of common occurrence. The tongue, uvula, and fauces are often so thickened and immobile as to make speech slow and indistinct. The temperature is usually subnormal, the mental faculties seriously impaired, the sight and hearing altered, digestion vitiated, and the muscular strength greatly reduced.

The course of the disease is chronic, lasting for years, and terminating usually in a state of marasmus with fatal issue.

Etiology.—The cause of myxœdema is imperfectly understood, though its association with abolition of the thyroid gland (after pathological change or ablation) is generally admitted. Stokes reports ten cases of acute myxœdema following thyroidectomy. In these cases, beside the rapid occurrence of the symptoms enumerated above, there were convulsive seizures of an epileptiform character. Of four hundred and eight complete thyroidectomies analyzed in the Clinical Society's report, in sixty-nine myxœdema developed. The result did not occur when a part of the gland was left. The influence of heredity is distinctly shown in cases reported by Ball, Ord, Saville, and Taylor. The disease affects women more often than men, in the proportion of seven to one. Children are attacked, but the malady is more common in individuals between thirty-five and fifty years of age.

It is undetermined what relations, etiological or other, subsist between the members of an interesting group of maladies, all characterized by cutaneous changes or dystrophy of the appendages of the skin, and total or partial abolition of the functions of the thyroid gland. In this group are to be named not merely myxœdema, but also myxœdematous cretinism and Graves's disease. These maladies are denominated by some authors the "thyroid cachexias."

Pathology.—In nearly all cases examined the thyroid gland is found to be markedly reduced in size and its glandular structure seriously impaired by substitution of fibrous connective tissue for the epithelial cells lining its secreting acini. At first there is a small round-cell proliferation, which gives place to changes resulting eventually in a firm thickening of both the gland and its capsule. The lumen of the arteries becomes obstructed; and, in cases, new-formed lymphatic tissue is found surrounding the atrophied lobules.

Examination of affected regions of the skin discloses slight epidermal atrophy, replacement of connective-tissue trabeculæ with fine nucleated fibrillæ, a small-cell infiltration in the upper part of the corium, and an endarteritis obliterans similar to that recognized in the thyroid gland. The epithelium of the coil- and sebaceous glands is

the seat of swelling and proliferation, which eventually produces occlusion of the lumen of these emunctories and explains largely the cutaneous symptoms of the malady. The hair-follicles and the nerves (fibrosis of hair-pouch, perineuritis) may or may not be invaded by a similar process.

Diagnosis.—Cases of myxœdema are readily distinguished from those of elephantiasis by the generalization of the symptoms, the nervous state of the patient, the fat-deposits, and the condition of the thyroid gland. Acromegaly involves the bones; in lepra there are commonly anæsthetic symptoms or characteristic tubercles.

Treatment.—The treatment of myxœdema has hitherto aimed at amelioration of the symptoms by the employment of roborant and tonic measures; alkaline and sulphur baths; electricity and massage. The later method of treatment, however, is by thyroid-grafting, by administration of thyroids, and by hypodermatic injection of from 5 to 15 minims of liquid extract.¹ Whether there be employed the gland itself of the sheep, the liquid extract, or the powder skillfully prepared by evaporation, the results are satisfactory in so large a proportion of cases that the prognosis of this group of disorders presents no longer an element of gravity. The headache, faintness, loss of weight, neuralgias, and even albuminuria, with other symptoms immediately following the employment of the thyroids named above, do not seem to have an adverse influence upon the remoter benefits received from the treatment.

¹ Cf. "Feeding Thyroids in Myxœdema," by J. J. Putnam, *Amer. Jour. Med. Sci.*, August, 1893.



CLASS IV.

ATROPHIES.

ATROPHIA CUTIS.

(Gr., α, privative, and τροφή, nutrition.)

ATROPHIA SENILIS.¹

(SENILE ATROPHY OF THE SKIN, ATROPHODERMA SENILE.)

This is the frequently recognized cutaneous degeneration peculiar to old age. The skin becomes colored in various shades of brown, either uniformly or in tolerably distinct pea- to bean-sized maculations over the face, the dorsum of the hands, the genitalia and the anus, and the lower extremities.

Symptoms.—The skin assumes a dull-yellowish hue, is seamed with furrows and wrinkles, is dry and inelastic, may desquamate slightly, and, losing the cushion of fat upon which it rested in earlier life, is either readily raised from the subcutaneous structures or depends from them in loose folds. The hairs on the affected areas may fall or may undergo regressive changes to the lanugo-type. Pea- to finger-nail-sized verruciform, dirty-yellowish accumulations of sebum and epidermis become visible, often in numbers on the face and elsewhere, softish and readily scraped from the surface or firmly adherent and scaly, or there may be small pendulous shrivelled pouches representing fibromata that have disappeared. These epithelial growths, especially when irritated, are not infrequently the beginning of malignant epithelioma. Occasionally they are commingled with whitish and grayish maculations or pin-head-sized and larger telangiectases.

In quantitative senile atrophy the pathological changes include: a general thinning of both corium and epidermis, as a result of which their characteristic interdigitations largely disappear; an increased pigmentation in the rete; a shortening of the hair-follicles; a dilatation of the sebaceous and coil-glands, the mouths of which often become blocked with epithelial detritus; the obliteration of some vessels and the dilatation of others; and the disappearance of the fat-cells from the meshes of the connective tissue.

In degenerative atrophy there may be fatty, amyloid, vitreous, and other changes of one or of several elements of the skin. Neumann described a senile atrophy with a granular degeneration and a vitreous swelling of the connective-tissue fibres. Schmidt, Reizen-

¹ For bibliography, see Himmel, Archiv, 1903, lxiv., p. 47.

stein, and Unna think these changes due to a peculiar arrangement of the elastic fibres and their partial degeneration into *elacin*, or, in combination with the collagen, into *collastin* and *collascin* (Unna). These changes in the elastic fibres are manifested through the peculiar staining qualities of the latter, and in the light of modern technique are exceedingly interesting, as they occur not only in atrophy, but also in other cutaneous disorders.

Treatment.—Senile atrophy cannot be remedied, but it may often be prevented or postponed by securing for the skin and for all the tissues of the body the best possible nutrition and hygiene, and by protecting the skin from exposure to cold and other harmful influences. The nutrition of the skin may often be improved by the proper use of bran- or salt-baths, massage, electricity, or inunctions of oil. Cod-liver oil or other fats may usually be added to the diet with advantage. Care must be taken to protect all warty and other epithelial growths from irritation, with a view to the prevention of malignant changes. (See also *Keratoses Senilis*.)

ATROPHIA MACULOSA ET STRIATA.¹

(ATROPHIC SPOTS, ATROPHODERMA STRIATUM ET MACULATUM.
Fr., VERGETURES.)

These forms of cutaneous atrophy may conveniently be divided into the so-called idiopathic and the symptomatic.

Partial Idiopathic Atrophy.—Partial idiopathic atrophy of the skin occurs most frequently in linear, cicatriform, often parallel striæ or streaks (a centimetre or more in length) developed chiefly about the hips, buttocks, and upper portion of the thighs, in persons of both sexes of adult years. Less frequently these striæ are observed upon the neck, the trunk, and the extremities. They are insidious of development, indelibly persistent, and appear as sensibly thinned, glistening, and often depressed lines or furrows, having a whitish hue, with an occasional blending of a very delicate purplish tint. They are usually multiple, and at times abundantly displayed, running in various curves, for the most part at angles with the long axis of the body. They occasion, as a rule, no subjective sensation.

Much more rarely the atrophic areas occur in macular patches. The lesions are then fewer, more isolated, and are discovered more frequently upon the extremities, but also upon the trunk, varying in size from that of a coffee-bean to that of a chestnut. This form of atrophy often succeeds either an erythematous or a pigmented condition, which very slowly changes until there is formed a dead-white, round or oval, often insensitive patch, more or less depressed, resembling coarsely a vaccine cicatrix. These areas usually show partial or complete alopecia.

Féré and Quemonne² have described two singular cases of the

¹ For bibliography, see Heuss, *Monatshefte*, 1901, xxxii., pp. 1 and 53.

² *Le Progrès méd.*, 1881, ix., p. 837.

disease observed in Charcot's clinic. In one of these cases appeared minute, whitish, elongated cicatrices, about which there was a marked pigmentation of the skin. They were abundant in the lumbar region. In a second case brownish lines appeared over the breast of an unmarried woman, that gradually grew paler while others appeared over the skin of the throat. Those lines which were recent had a brownish or a bluish-red color; others were of a dead-white hue; some appeared over the lumbar region and the upper part of the buttocks; but there was none over the belly, the groins, or the thighs. In both cases the regions attacked were those in which there was no suspicion that the *vergetures* resulted from overdistention of the skin.

Striæ Patellares.—Bunch¹ has described and presented the literature of this strange affection. It consists of transverse streaks of cutaneous atrophy over both patellæ. It usually follows typhoid fever.

These lesions are distinguishable from sequels of scleroderma, syphilis, and other diseases capable of leaving atrophic areas. A previous history of such pathological conditions would usually be obtainable. In the cases in which there is precedent telangiectasis, hyperæmia, or marked pigmentation of the spot, the diagnosis, as several authors suggest, is attended with some difficulty.

Partial Symptomatic Atrophy.—Partial symptomatic atrophy of the skin in its simplest form may result from traumatism (the persistent marks sometimes left on the skin, for example, by a lash with a whip, insufficient to wound the epidermis but capable of injuring the deeper elastic tissue); or from the slow pressure of tumors (ovarian, uterine, mesenteric, etc.), by which the skin is distended. The well-known results of the stretching of the skin in a first pregnancy conducted to term are linear atrophies, at first of a violet tint, and later of a dead-whitish hue, that are indistinguishable, both clinically and pathologically, from idiopathic lesions of similar aspect. These atrophies are occasionally seen over the belly and thighs of male subjects with a protuberant abdomen; more rarely in persons of extreme thinness. Small atrophic scars result frequently from the mechanical pressure of inflammatory and other infiltrations in lupus, syphilis, leprosy, and other diseases. Partial symptomatic atrophy, with degeneration of the cutaneous elements (fatty, lardaceous, waxy, etc.), is a sequel common to a long list of cutaneous affections.

Congenital Atrophy.²—This term is used to designate cases in which there is a congenital defect rather than an atrophy. The aplasia affects the scalp and consists of slightly depressed, smooth bald areas, coin-sized and larger, having defined borders and present at birth. Microscopically the epidermis and derma are thinner than normal and the subcutaneous fat is not present, the papillary layer and the muscles are poorly developed and the hair and glandular organs are absent.

¹ B. J. D., 1905, p. 1.

² Archiv, 1903, lxxvi., p. 407.

DIFFUSE IDIOPATHIC ATROPHY.

(ACRODERMATITIS CHRONICA ATROPHICANS, ATROPHIA MACULOSA CUTIS, ANETODERMIA ERYTHEMATODES, ERYTHROMELIA.)

This malady was first described by Buchwald in 1883, since which time a number of contributions have been made to the literature without materially adding to our knowledge of the subject beyond establishing the clinical description of the disease. Herxheimer has presented the most important paper on the subject in recent times.

Symptoms.—The atrophy is apparently primary. Without preceding inflammation or other visible tissue change an atrophy of the skin develops in patches or in streaks. They slowly but steadily multiply, coalesce, and extend, until the disease affects an entire limb or an extensive area of cutaneous surface. The distribution is apt to be symmetrical. The affected skin is slightly depressed, of a bluish-red color, thin and wrinkled. In fully developed cases the skin presents a crumpled cigarette-paper appearance which is highly indicative of the affection, or in some cases (Bronson's case) it presents a "baked-apple" appearance. The subcutaneous tissue is reduced; and in some cases normal and also enlarged veins shine through the thin skin. The tendons also show more plainly than normal. The lanugo hairs are few in number and the glandular organs disappear. The sensation is normal but a sense of coldness may be experienced. Herxheimer (1902) showed that it could be demonstrated microscopically and sometimes clinically that an inflammation terminating in atrophy was always present on the peripheral border of the affected area.

Erythromelia (Pick) is a special form of the disease in which the skin atrophy, presenting a bluish-red color, starting from the ankle, gradually extends up the limb, and the normal fine plexus of veins shines through the thin skin.

Etiology.—The cause of the disease is unknown. In some cases it has followed colds. Crocker states that it may be congenital. As a rule it affects people in middle life, and the general health is not impaired.

Histology.—There is an infiltration around the blood vessels of the derma in the inflammatory area, and disappearance of the elastic fibres as the most important finding in the atrophic area.

Diagnosis.—It can scarcely be doubted that cases of scleroderma and syringomyelia have at times been included in the list of disorders described in this connection.

Treatment.—Treatment is prophylactic as in senile atrophy.

GLOSSY SKIN.

(ATROPHODERMIA NEURITICA.)

The "glossy fingers" described by Sir James Paget,¹ Gull, Mitchell, and others, are tapering, smooth, hairless, unwrinkled,

¹ Med. Times and Gaz., 1864, i., p. 58.

glossy, pink, and ruddy or blotched, as if with permanent chilblains. One or several fingers are affected. The condition is associated with neuralgia or nervous impairment indicated by abnormal sensations, as of heat or intense burning. There is usually, however a precedent, or subsequent neuralgic pain, with incurvation of the nails and at times a heaping up of epidermal masses beneath the free border of the nail. In consequence of retraction of the skin over the distal phalanges the terminal extremity of the digit appears thin and drawn away from the nail-bed.

The complications of this condition are changes in the sebaceous glands and the coil-glands, loss of hair over the phalanges, excoriations, and in severe cases ulceration.

This disorder may be associated with grave systemic states, such as lepra, or with gout and rheumatism. It is marked clearly in some classical instances of severe palmar and plantar keratosis. It is found also in those in whom for any reason the circulation is feeble and there has been exposure of the extremities to severe cold. It has likewise been noted as the result of centric and peripheral changes in the nervous system. In some cases the cause is recognized as a neuritis; in other cases it may more properly be classed with the trophoneuroses of the skin. The relations of this and several symmetrical disorders of the hands and feet to the so-called "perforating ulcer of the foot," "asphyxia" of the extremities, "symmetrical gangrene" of the extremities, and so-called "dying of the fingers," all manifestly trophoneurotic affections (see the chapter on this subject), have not yet satisfactorily been established.

Blanching Atrophy of the Skin.—This peculiar degeneration of the integument is characterized by an unnatural whiteness or pallor of the skin-surface, with considerable tension and tenuity of the epidermis, usually limited to the extremities (the arms and palmar and plantar faces of the hands and feet, and the thighs and legs). Moderate exfoliation occurs, and, in connection with the tension to which the skin is subjected, is responsible for more or less painful subjective sensations. The disorder is chronic in its course and it may originate in infancy.

This condition is occasionally illustrated by persons affected with a sensori-motor paralysis of one limb, when the muscles waste and the fat-cells persist, multiply, or wholly disappear. The skin of such limbs, wholly or in patches, becomes unnaturally soft and delicate, and undergoes a loss of pigment and hairs, at the same time that its bulk actually diminishes. The nails may participate in the process. In other cases of trophic disturbance the skin shrivels and assumes, instead of a whitish, a yellowish or yellowish-gray tinge.

MULTIPLE BENIGN TUMOR-LIKE NEW-GROWTHS OF THE SKIN.

Under this title Schweninger and Buzzi¹ describe and figure lesions occurring chiefly on the back, but also on the arms and the chin of a married woman twenty-nine years of age. These lesions were bean- to coin-sized, bluish-white and slate-tinted formations, with delicate telangiectases over the surface of some. By pressure most of them could be forced into a shallow pit in the underlying tissue, the tumor returning like a ventral hernia after removal of the pressure. The larger seemed to spring from the smaller lesions, and as they increased in age became flatter, less white, harder, and less compressible. They produced no subjective sensations and in no way interfered with the general health of the patient. The vigorous treatment adopted seemed to have but little effect on the growths.

Under the microscope sections of the excised skin showed that elastic fibres were in every instance wholly wanting in the affected portions, nor were there signs of remnants or of degeneration-products of these elements. It was assumed that there had been in each locality a retraction of the elastic tissue, and that the resulting disease was due to a disturbance of the static balance, the overgrowth developing until the equilibrium was established. A growth of new and young cells was visible about the adventitia of the vessels and most of the accessory organs of the skin.

KRAUROSIS VULVÆ.²

(Gr., *κραῦρος*, hard.)

The rare and curious condition to which this name was first given by Breisky in 1885, is now generally recognized under the title given by him, though Weir of New York first described the disorder as an ichthyosis, and was followed by Tait, describing a similar condition. Recently George Thibierge, of the St. Louis Hospital in Paris has, after a large experience, described the disease in its several

¹ Internat. Atlas, 1890-1891, v.

² Bibliography: Baldy and Williams, Amer. Jour. Med. Sci., cxxviii., 528. Jayle, Rev. de gyn. et de chir. abdom., July-Aug., 1906, 633. Thibierge, Annales, 1908, s. iv., ix., p. 1. Weir, N. Y. Med. Jour., March, 1875. Tait, Serpiginous Vascular Degeneration of the Nymphæ, 1877. Fleischmann, Prager. med. Wochenschr., 1886, No. 36. Heitzman, Breisky, Trans. Amer. Derm. Assoc., Berlin, 1888, p. 60. Smith, Buffalo Med. and Surg. Journ., 1890-91, xxx., p. 283. Hallowell, Northwestern Lancet, xi., 1891. Frederick, The Times and Reg., 1891, xxii., No. 8. Orthmann, Zeitsch. f. Geb. und Gyn., Bd. xix., p. 283. Adam, Australian Med. Journ., Melbourne, 1892, p. 407. Bartels, S., Inaug. Diss., Bonn, 1892. Reed, Amer. Gyn. and Obstet. Journ., N. Y., 1894, v., p. 556. Martin, A., Centralb. für Gyn., 1894, No. 13, pp. 310, 323 u. 394; Volkmann klin. Vortr., N.F., No. 102. Marocco, Rif. med. Napoli, x., 1894. Elisha, Zeitschr. f. Geb., Bd. xxiv., p. 1460. Rona, Orvosi hetilap, 1894, No. 13. Gordes, M. Monats. f. Geb. u. Gyn., Bd. lii., p. 305. Longyear, Amer. Journ. of Obstet., Dec., 1895, p. 823. Neumann, Wien. klin. Wochenschr., 1896, p. 211. Pichevin et Pettit, Semain. Gyn., Paris, 1897, pp. 49-51. Pfannestiel, Gesellsch. für Vated Cult., Bresl., 1896. Le Roy Du Barres, Semain. Gyn., Paris, 1897, ii., p. 114. Veit, J., Handbuch der Gynäkologie, 1898, Bd. iii., pp. 145-154.

types. He calls attention to the fact that Breisky's original description covered one only of the clinical varieties of the disease.

The forms recognized to-day by both gynecologists and dermatologists are:

1. The white form—leucoplasic—which may be either simple or syphilitic in character.
2. The red—or inflammatory form—which may be betrayed with either follicular or vascular predominance of lesions.
3. The senile form.
4. The post-operative.

In each of these the picture presented is somewhat different.

The clinical features of the disease, whether in one form or another, and whether or not commingled, are commonly striking.

Symptoms.—The most of the patients are women either of advanced years, at or near the menopause, or younger women who have suffered ablation of the uterus or ovaries. The vulva is commonly shrunken, atrophic, dry, or oddly furrowed. The parts may be symmetrically or irregularly involved, the labia majora appearing to have been obliterated when the disease is at its height, the labia minora absent or fused in an indistinguishable tissue. The shrunken genitalia, the nymphæ, the clitoris and its hood, the vestibulum, and the entire vulvar ring are eventually involved and produce a characteristic atrophy of the entire organ. The pubic hairs whiten or fall and the mons flattens.

According as one or another type of the disease develops, the picture changes: In some cases the parts are whitish and dry; in other cases they are smeared with a thin mucus; in others the skin is furrowed, wrinkled, pitted, spotted, or scaling; in yet others the subcutaneous vessels become visible beneath the thinned and glazed epidermis. The clitoris may disappear beneath its hood and be represented by a mere depression. The orificium vaginæ may be so reduced as to scarcely permit the introduction of the little finger. In some cases, the disease involves also the anal and peri-anal region. The color of the retracted tissues may be whitish, reddish, pinkish, yellowish, or even bluish. In almost all types of the disease the retracted tissues have a thoroughly characteristic glistening aspect, shining as if varnished.

Several cases have come under my observation, two ultimately developing as a carcinoma, the others strikingly suggestive of leucoplakia. Jayle, discussing the relation of the last named disorder to kraurosis, calls attention to the absence of any tendency to retraction in the pure types of leucoplasia; and yet believes that the two affections may coexist ("Leucoplasic Kraurosis").

Etiology.—The cause of kraurosis vulvæ is obscure. In ten per cent. of cases the disease is complicated with carcinoma, though whether originating or following in the course of the last named disorder, is not determined. Many believe that an inflammatory stage precedes the atrophic contraction. A number of cases have been

shown to be strictly post-operative, following ablation of the uterus or ovaries or both. Syphilis, blennorrhagia, neurotic influences, catarrhal discharges from the neighboring mucous tracts, scratching, and traumatism have all been cited as effective in its production; but most of these causes, and in particular venereal diseases, have been discredited as effective agents.

Pathology.—Veit, Martin, Baldy and Williams agree in believing that kraurosis of the vulva is a purely inflammatory disease produced by local causes. Jayle recognizing in many cases the atrophic nature of the process, finds nothing either in the epiderm or derma sufficient to explain the special phenomena exhibited. Thibierge, finding in some of his patients lesions of the mucous membranes of the mouth, corresponding with those recognized in the vulva, believes that the entire process is under the impulse of one general cause, viz., a senile atrophic involution of the integumentary system. The striking localization in the genitalia of so many cases is due to the influence of the ovaries and uterus.

Treatment.—The treatment is largely surgical, though radiotherapy has furnished good results. Medicinal treatment is indicated in the leucoplastic cases, in which cauterization had been practiced with good results. After surgical ablation, wholly or in part, of the sclerosed mass, plastic operations have been successfully practiced.

Prognosis.—The prognosis is unfavorable for the most of cases. The course of the disease is toward persistency and slow extension of symptoms.

PERFORATING ULCER OF THE FOOT.

(MALUM PERFORANS PEDIS. *Fr.*, MAL PERFORANT DU PIED.)

This disorder, first named by Vesigné, has been studied by Savory and Butlin,¹ Gasquel,² and others. The name is an unfortunate one, since many cases to be classed only in this category have neither ulcerative nor perforating symptoms.

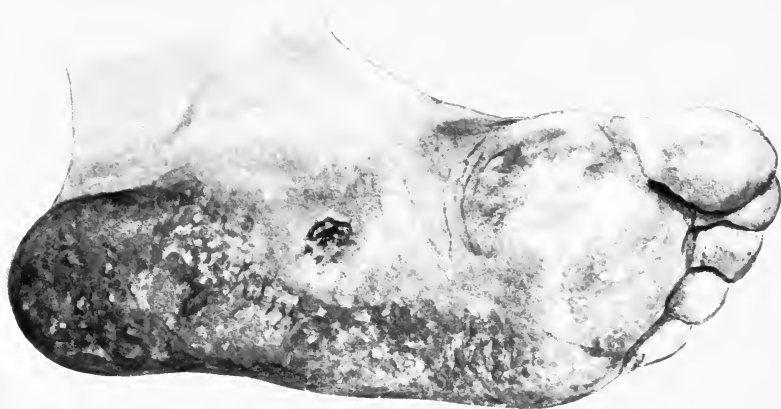
Symptoms.—The patient frequently complains of neuralgic and rheumatic pains and anæsthesia is usually present. The first objective symptom is a proliferating thickening of the epidermis like a corn usually single, occasionally multiple, appearing over a point of pressure (first or fifth metatarsophalangeal or metacarpophalangeal joint, etc.). Inflammation and suppuration proceed beneath this thickening, spreading first to the soft parts of the sole and perhaps to the bone itself. Gradually a sinus forms, reaching from the side of the corn to the deeper parts involved. When fully developed the lesion consists of an ulcer the surface of which is covered with a luxuriant growth of granulations and surrounded by an extensive collar of callous tissue. A probe introduced into the granulation tissue passes into a sinus and may lead to dead bone.

In some cases the nails are altered; superfluous hair grows on the

¹ *Mécl.-Chir. Trans.*, 1879, lx., p. 46.

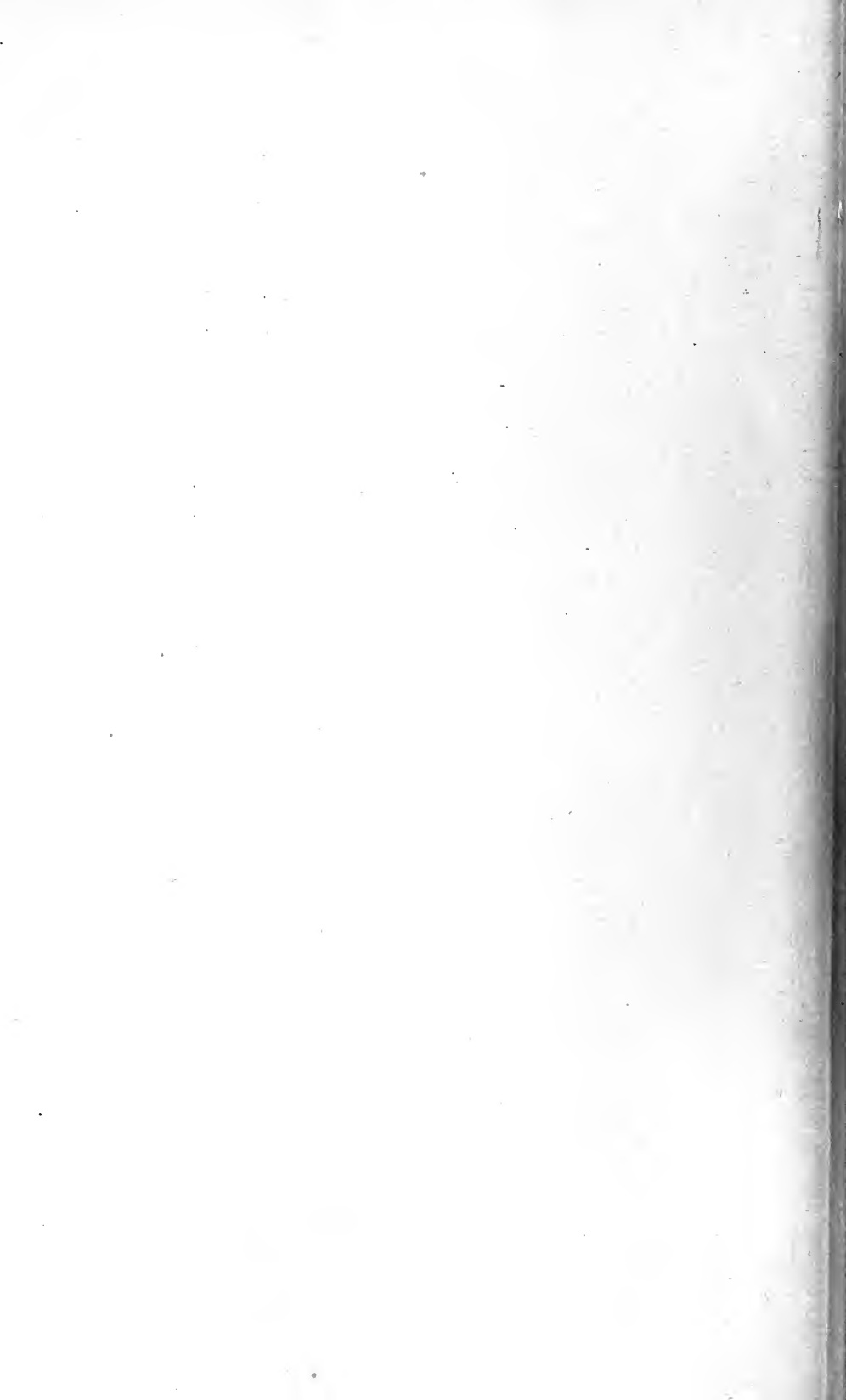
² *Thèse de Paris*, July, 1890; a *résumé* of ninety-one collected cases.

PLATE XXIII



Malum Perforans Pedis, with Symmetrical Keratoma
of the Palms and Soles.

(From a water-color sketch.)



dorsal surface of the foot and the skin of the involved extremity; pigmentation, erythema, or eczema may occur; and the parts may become affected with either anidrosis or hyperidrosis.

The patients are often young adults. The palms when involved never exhibit the translucent, yellowish, wash-leather-like appearance of the same condition of the soles, but rather suggest the dry, scaly features of the palms in certain forms of erythematous eczema of these parts, but always without itching, and with coincident plantar tylosis. The soles, however, present the typical appearance of callositas throughout the entire region, the callosity reaching somewhat upward over the heel, and in certain patients relatively sparing the instep. In some cases the nails are not involved. The feet are always as cold to the touch as in pernio.

Etiology.—The disease is caused by pressure or injury to a foot which presents a lessened innervation either from disease of the spinal cord or peripheral neuritis. It is more common in locomotor ataxia than in any other disease, but it may be observed in prolonged sciatica, or in neuritis of alcoholism, syphilis, leprosy, or diabetes.

Pathology.—Histological examination has shown destruction of the myelin and axis-cylinder of twigs of nerves supplying the affected parts. According to Savory and Butlin, the sensory and nutrient fibrils of the involved nerves degenerate in consequence of pressure exercised upon them, by increase of the endoneurium, the motor fibrils escaping owing to their large size and thicker medullary sheath, a view untenable for all cases. Thomasczewski¹ reports ten cases associated with tabes, leprosy, diabetes, or cerebral or spinal disease, the location, characters, and course of the ulcers being practically the same in all the cases. He believes the ulcers are due to trophic changes in the tissues resulting from systemic disease, usually that of the central nervous system, though the local anaesthesia and pressure are undoubtedly etiological factors in some instances.

Diagnosis.—The diagnosis is between Madura foot, tuberculosis, and simple callositas, a distinction readily established by the evident neurotic phenomena seen in perforating disease of the foot.

Treatment.—By curetting away all diseased tissue and putting the foot completely at rest the ulcer may be made to heal, but it usually reappears when the patient again tries to walk. Amputation of the toe and joint affected avails little. It is not unusual even after amputation of the foot for the disease to appear in the stump. A roborant treatment and mechanical devices to prevent the use of the foot are to be advised in most cases.

Prognosis.—The prognosis is doubtful.

¹ Münch. med. Wehnschrift., 1902, xlix., pp. 779 and 840.

MORVAN'S DISEASE.

(SYRINGOMYELIA, ANALGESIC PARALYSIS WITH WHITLOW.
Fr., PANARIS ANALGÉSIQUE.)

Morvan's disease is a paretic affection of the spinal cord, chiefly involving the upper extremities, accompanied by pain and producing a series of whitlows, affecting first one side of the body and then the other.

Symptoms.—In this disorder the arm is commonly first involved, the approach of the disease being insidious and usually first noticed on account of the production of pain and some loss of nervous and muscular power. At times the first sign of involvement is the production of whitlows, which either early or late in every case are tolerably sure to appear. In other instances the disease first displays an analgesia similar to that occurring in some subjects of lepra, the attempt having been made to establish a relation between the two diseases.¹ In time atrophy of the interosseous muscles, of the flexors of the wrist, and of the tissues forming the thenar and hypothenar eminences may result. The integument of the affected limb has a bluish or empurpled look; it may be thinned or thickened, and the seat of fissures, vesicles, and bullæ, as well as of the characteristic whitlows, which vary in number from two to four or six. Ulceration, extending as deeply as to the tendinous sheaths, may result, and, as a consequence of one or more of the changes described above, the phalanges may necrose and be separated from the hand.

Trophic changes arise in connection with the disease, pointing for the most part to an origin in disturbances of the centric nervous system. Among these disturbances may be named: hyperidrosis; diminution of, variability in, or complete absence of the reflexes; visual changes; contracture of the fingers; and a general distortion of the hand. Scoliosis and arthritic complications have been recorded in a number of cases.

The disease is usually protracted in its course, lasting in some cases for a quarter of a century.

Etiology.—The affection may develop first in childhood and last until middle life and longer, though more often it is first noticed after the occurrence of puberty. Women are much less often affected than men. Traumatism, malaria, and rheumatism have all been cited as possible causes of the disease. Its exact etiology is obscure.

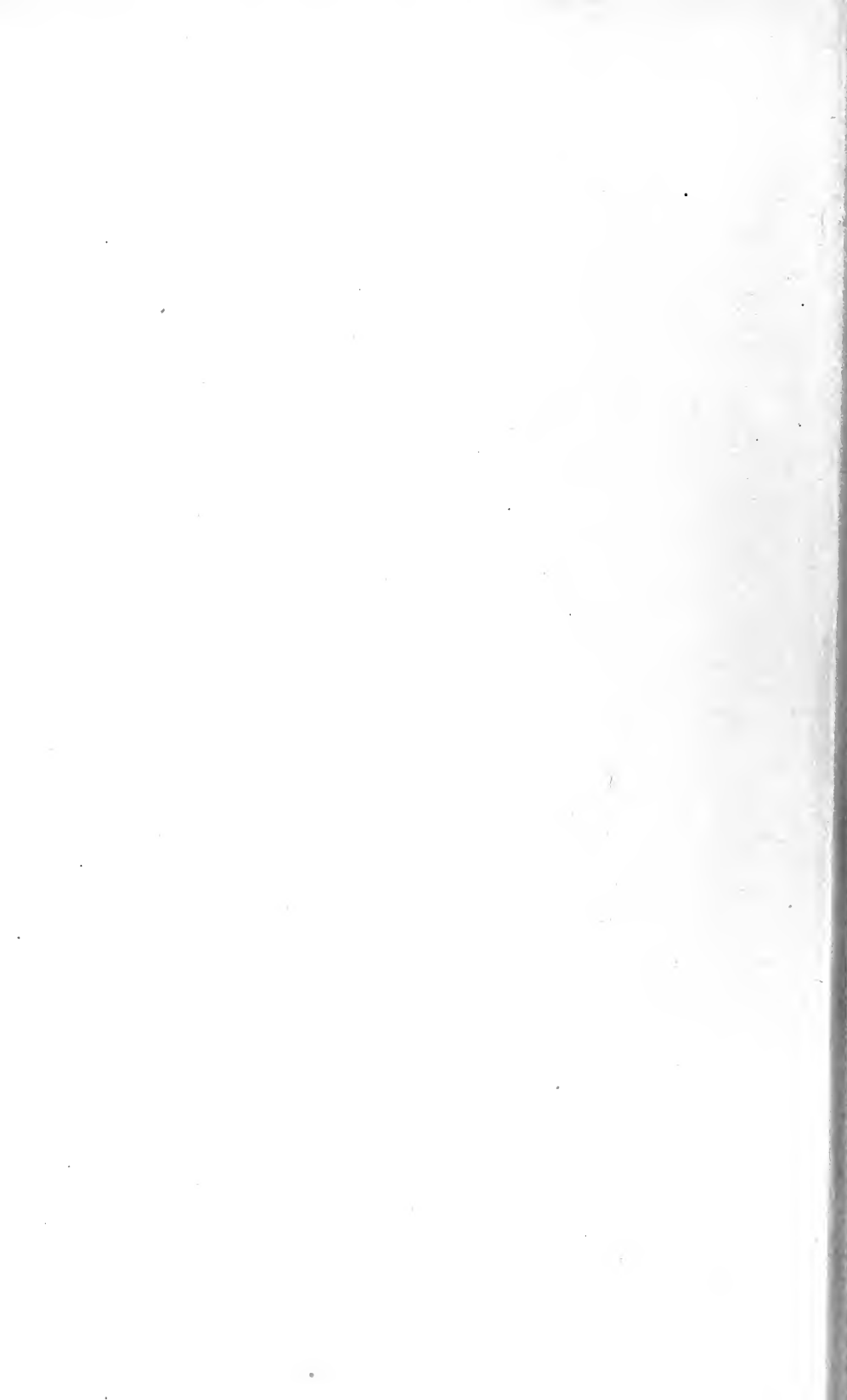
Pathology.—Neuritis and thickening of the neurilemma have been discovered in the nerves distributed to the affected parts; as also sclerosis of the posterior cornua and columns of the cord. The cavities recognized in the central canal, distended with fluid, are supposed to be due to absorption of gliomata.

Diagnosis.—The recognition of a fully developed case of Morvan's

¹ Cf. Zambaco, Trans. First Internat. Leprosy Congress, Berlin, 1889; Dyer, New Orleans Med. and Surg. Jour., 1893, xxi., p. 81; and Calderone, Giorn. ital., 1901, vi., p. 756 (includes survey of the subject and bibliography).

disease is readily established by taking into consideration the paretic symptoms present, the whitlows, and the perversions of sensation, more particularly in appreciation of temperature-changes, pain, and contact with foreign bodies. Attention has already been directed to the striking resemblance between certain phenomena of anæsthetic lepra and those of syringomyelia. Scleroderma and glossy fingers are to be differentiated by the special peculiarities of each.

Treatment.—Treatment is to be conducted on the general principles, surgical and medical, relied upon for meeting the indications of each case. In general the hygienic and dietetic management of the patient with a highly roborant regimen is conducive to recovery. Many of the subjects of the disease have been reported as relieved or even wholly cured.



CLASS V.

PIGMENT ANOMALIES.

LENTIGO.

(Lat., *lens*, a freckle.)

(FRECKLE, EPHELIS. *Fr.*, EPHÉLIDE, LENTILLE; *Ger.*, SOMMER-SPROSSE.)

Symptoms.—This condition is due to excessive and irregular deposit of pigment in the skin, producing the pinhead- to bean-sized spots of circinate or of irregular outline, frequently grouped and even confluent, which spots are commonly designated as “freckles.” They are most frequently seen symmetrically distributed on those parts of the body ordinarily exposed to the light and heat of the sun and to atmospheric influences, such as the face, the neck, and the backs of the hands in persons of both sexes. In those individuals whose bodies are to a greater extent similarly exposed they occur upon the chest, the back, and over the extremities. In other persons they may be seen upon parts not thus exposed, such as the penis, the scrotum, and the inner surfaces of the thighs, a fact which indicates that freckles are not always the result of the operation of the agencies noted above. They vary in color from light yellow, salmon, or red to the deepest brown; and are most noticeable in those having red hair and a delicate skin. Freckles occur rarely in infancy, partly, perhaps, on account of the infrequency of outdoor exposure in tender years. They are usually seen first about the age of the sixth to the eighth year. They are commonly observed in mulattoes, individuals of a race particularly disposed to anomalies of pigment-distribution. Once developed, the lesions may persist through life without marked alteration; or may fade with each recurrence of the season of winter; or in milder cases may disappear. They usually share in the atrophic changes of old age, and, when persisting to that period, may then spontaneously disappear. They are not the source of subjective sensation.

A special form of lentigo frequently affects the covered parts of the body in fibroma molluscum, in xeroderma pigmentosum, and where the freckles are unilateral or arranged in streaks like a linear nævus. This variety is a manifestation of defect in development. In doubtful cases it could be distinguished from the ordinary form by microscopical examination of the tissue as Unna has shown that the rete-pegs are not properly developed in this variety. They present a dumb-bell shape or they form grotesque figures.

Etiology.—Freckles are unquestionably produced and aggravated at times by the action of the light and heat of the sun, as common experience suggests; but it is evident that these forces must act upon a susceptible skin. Of a hundred sailors exposed in precisely similar situations on a long cruise, some of the number will uniformly be “tanned” and others deeply “freckled.” Attention has been called to the occasional occurrence of lentigo in the protected parts of the skin. Exposure to sea-air and fog, with obscuration of the sun, is sufficient to produce the result.

Pathology.—Freckles are due to an increased deposit of pigment in definite areas of the rete mucosum of the epidermis, never in the corium. The pigment accumulates densely in and about the prickles-cells, which become apparently softer and lose their spines at a later stage. Unna divides pigmentations of the skin into two classes: hæmosiderosis (due to granules containing iron) and melanosis (due to pigments in which the presence of iron has not been determined). In lentigo no iron-reaction has been recognized. Lassar urges, with strong probability, that there is always a congenital predisposition to these pigment-formations that requires certain external conditions for development.

Treatment.—The treatment of lentigines is that of chloasma and other pigmentations of the surface. Wertheim, of Vienna, advises:

R	Hydrarg. ammon. muriat.,	gr. lviij;	3 75
	Bismuth. magister.,	gr. liij;	3 50
	Ungt. glycerini,	ʒj;	30 M.
Sig.	To be applied every other night.		

Bulkley employs:

R	Hydrarg. chlor. corros.,	gr. vj;	4
	Acid. acetic. dilut.,	fʒij;	8
	Boracis,	ʒij;	2 66
	Aq. ros.,	fʒiv;	120 M.
Sig.	To be applied night and morning, at first with gentle brushing; afterward by rubbing.		

Hardaway touches each freckle with a rather stiff needle connected with the negative pole of a galvanic battery, and he finds the results satisfactory.

Most of the methods employed by charlatans for the removal of freckles depend for their success upon thorough blistering of the surface. Inasmuch as by this process the epidermis is removed, the pigment of its cells is also measurably removed with it, and the new epidermis is for a time free from blemish. But in all such cases the ultimate result is a deeper and more persistent pigmentation than that which was previously visible.

ANOMALIES OF PIGMENTATION.

Symptoms.—In melanodermia the skin is either diffusely discolored in various shades, or the maculations occur in patches larger

than those of lentigo, fairly well defined, and irregular in contour, the so-called "liver-spots." In color they vary from a scarcely perceptible staining of the skin that requires a strong light for its detection, to a deep-yellow, a yellowish-green, a chocolate-brown, or a blackish shade (*Melanoderma*). They may be idiopathic or symptomatic in character. The idiopathic varieties of pigmentation are produced by all externally operating agencies, in consequence of which an undue afflux of blood is persistently determined to any portion of the skin. It is largely from the blood that the pigment is derived, hence the stains produced by the pigment are, to a certain extent at least, proportioned to the hyperæmia, stasis, or extravasation of the vascular fluid. Among these externally operating agencies may be named pressure and friction (as over the part covered by the pad of a truss); traumatism (as after the severe scratching of the skin affected with lice, eczema, or scabies); heat (as in diffuse "tanning" of the face, or "sunburn" following exposure to the solar rays); and the toxic or irritating effect of externally applied substances, such as mustard, capsicum, cantharides, and other articles capable of producing either vesication or pustulation of the skin-surface. Persistent or even permanent pigmentation of the skin upon the face, shoulders, and bosom, especially of young women, may be produced by the repeated application of such topical medicaments.

The symptomatic varieties of pigmentation are the result of disorders either systemic or those involving the internal organs. They occur as either circumscribed or diffused, localized or generalized, spots, mottlings, stainings, or "masks" of the skin, and they vary in color from the lightest to the darkest shades. One of the most common, and at the same time the most marked of these varieties, is

Chloasma Uterinum.—Chloasma uterinum is so called because of its frequent association with certain physiological or pathological conditions of the uterus, both among married and single women. Thus in pregnancy, sterility, hysteria, chlorosis, ovarian disorders and tumors, and functional derangements of the uterus there can be observed at times a facial discoloration extending equably over the forehead and reaching nearly to the line of the hairs at the scalp, in the form of a faint or a decidedly reddish-yellow or deep-brownish tinge. At other times the discoloration is macular and asymmetrical, involving the eyelids, the cheeks, the lips, or the chin. When the chloasma assumes the mask-like form it is usually most pronounced over the forehead, but it may involve the whole facial region, being less distinctly defined below than above. Similarly, the well-known changes occur in the areola of the nipple, along the linea alba, and about the external genitalia. Pigmentations of this variety are caused by the absorption of uterine toxins.

Chloasma (or Melanoderma) Cachecticum.—This is another of the symptomatic pigment-disorders, characterized by changes in the color of the integument of the subjects of tuberculosis, syphilis, cancer, chronic alcoholism, malaria, and other disorders. Its hue varies between a faintly defined yellow to a deep chocolate.

Hemochromatosis.—This is a pigmentation of the skin and viscera associated with hypertrophic cirrhosis of the liver and extensive sclerotic changes in the pancreas; it may terminate in glycosuria and in the terminal stage it is called *Bronze diabetes*.

Addison's Disease.—Addison's disease, formerly thought to be due exclusively to lesions of the suprarenal capsules, is of the same nature, and is characterized by a peculiar bronzing of the skin. Overbeck and Greenhow have shown that the capsules may be destroyed wholly without changes in the skin-color resulting. The pigmentation may be general or be partial, and in the latter case is without definite lines of demarcation. It is commonly most pronounced over the face and neck, the scrotum, the groins, the axilla, and the nipple and areola. The hairs become coarse and dark; and dark or grayish-brown patches are at times visible over the mucous surface of the lips, the gums, and other parts of the mouth. The bronze or mulatto-like color of the skin is intensified by stimulation or erosion of the cutaneous surface, and by exposure to light. In these cases there are generally marked asthenia and a feeble pulse, with anorexia and other signs of gastrointestinal disorder. When the result is fatal there may or may not be recognized pathological alterations of the suprarenal capsules. The pigment when examined furnishes no iron-reaction.

Hadra, of Berlin, reports a case of Addison's disease cured by extirpation of a small apple-sized tubercular neoplasm of the retroperitoneal glands. A suprarenal capsule was contained in the growth.¹

In Graves' disease² there may be cutaneous telangiectases, or freckle-like, patchy or diffuse pigmentation of the skin, usually most marked in regions which have normally more pigment than the general surface of the body.

Among the cutaneous disorders capable of producing skin-pigmentation may be named scleroderma, lepra, angioma pigmentosum et atrophicum, eczema (especially *e venis varicosis*), and general exfoliative dermatitis.

From all the above-named discolorations, which are due solely to deposition in excess of coloring-matters normally existing in the skin, it is necessary to distinguish the various dyschromiæ which are owing to the introduction into the integument of coloring substances, either supplied by other portions of the body or foreign to it. Thus, in *Icterus* the bile may color the skin from a light-yellow to a dark-chrome shade, the duration and severity of the cutaneous symptoms depending upon the nature and gravity of the hepatic disease. This condition is frequently accompanied by pruritus in various grades of severity, the exact causes of which are obscure.

Pigmentation from Ingestion of Arsenic.—The administration of arsenic in full doses for relief of nervous disorders in adults and chil-

¹ Med. Week, 1896.

² For a review of the cutaneous changes seen in Graves' disease with bibliography, see Dore, B. J. D., 1900, xii., p. 353; Hyde and McEwen, Amer. Jour. Med. Sci., 1903, exxv., p. 1000; Hyde, B. J. D., Feb., 1908, p. 33.

dren is frequently followed by a characteristic dull-brownish or dirty-colored discoloration of the skin of the neck and chest. In connection with these arsenical pigmentations, which are in some instances obstinate and generalized, may occur palmar or plantar keratoses and hyperhidrosis as well as keratoses appearing elsewhere, which may be the starting-point of an epithelioma. (*Cf.* Chapter on Dermatitis medicamentosa.)

Argyria.—A bluish, bluish-gray, slate-colored, or bronzed coloration of the skin may result from ingestion of silver nitrate. Argyria is most commonly the result of the administration of the drug in the treatment of epilepsy, but it is said to have also resulted from the topical application of silver-crayons to the throat, to the conjunctivæ, and even to the skin. Under what form the silver produces this effect, whether as an albuminate or other salt, is not known. The deposition, however, occurs in the form of minute particles of the metal in the connective tissue of the derma. The discolorations are most evident upon the parts of the skin exposed to the light, as the face and hands; but the chest and the lower extremities may be stained similarly. The connective tissue of the viscera is at times also involved, showing thus that the action of light is not essential to the production of the dyschromia. Two cases are reported as relieved by the administration of potassium iodide.

Tattooing.—By the process of tattooing mineral and vegetable substances are directly introduced into the corium by means of needles, for the production in the skin of various devices in colors. Individuals whose entire integument has been thus artificially covered with figures of different patterns by tattooing with indigo, vermilion, and cinnabar, are from time to time publicly exhibited. The results are indelible. Post mortem these pigments have been discovered not only in the derma, but also in the lymphatic ganglia nearest the site of their introduction.

Mongolian¹ Pigment Spots.—Infants of the darker races occasionally present bluish areas of pigmentation over the sacrum and buttocks which contrast strongly with the color of the general integument. These spots have been variously interpreted. They are not characteristic of the Mongolian race as was formerly supposed.²

Pigmentation of the Skin following Nervous Shock.—Bark³ has reported the case of a woman 70 years of age, whose entire cutaneous surface turned black the day after the suicide of her daughter. The pigmentation persisted and she died two years later of pneumonia. Post mortem acute lobar pneumonia was recognized.

Pathology.—The lentigines, ephelides, and chloasmata are all due to excessive deposit of the natural pigment of the body in the rete mucosum of the epidermis. Restoration of the normal color of the

¹ American Anthropologist, March, 1907.

² Ashmead, A. S., The mulberry-colored spots on the skin of the lower spine of Japanese and other dark races; a sign of negro descent. J. C. D., 1905; xxiii.; pp. 203–214.

³ Archiv, 1898, xlv., p. 283.

skin is usually proportioned to the extent and depth of the deposit, but the process is always very gradual. It can well be studied in the slow bleaching of the pigmentation of syphilitic cicatrices upon the lower extremities. In the dyschromias due to the introduction of coloring matters foreign to the body or foreign to the skin, the corium and the subcutaneous connective tissue are commonly stained.

The origin of the pigment in the skin being still undetermined, pathologists are unsettled as to the question whether migratory pigment-conveying cells are responsible for the change of color in the skin or whether the pigment-granules themselves migrate. Kaposi, Jarisch, and a few others believe that pigment is formed in the rete. Unna believes there are two distinct kinds of pigment, not however fully differentiated, formed in the corium and carried through the lymphatic spaces to the rete. Ehrmann,¹ after much careful investigation, states that there are special pigment-cells, or "melanoblasts," which are formed in the embryo from the mesoderm. These cells perpetuate themselves, being thus independent of all other bodies, and are connected by long processes or threads of protoplasm, along which the pigment flows in a viscous state. The cells obtain their pigment from the hæmoglobin of the blood. All pigment outside of these cells he considers hæmatin-detritus. In some of these cases there is no change in the walls of the blood-vessels and there are no signs of blood-extravasation.

Diagnosis.—The diagnosis of cutaneous pigment-hypertrophies is readily effected by observing: the persistence of the discoloration under pressure; the absence of all symptoms of hyperæmia, inflammation, and secondary changes in the skin; and the characteristic shades of color presented to the eye. In *tinea versicolor* there is usually slight furfuraceous desquamation, and the existence of a vegetable parasite is readily demonstrated by the microscope. The rare pigmentary syphilide is usually seen upon the neck and shoulders of infected women in the form of yellowish to brownish maculations, often arranged in an irregular network. The lesion is, indeed, one of the symptomatic chloasmata.

Treatment.—In all the symptomatic pigment-anomalies the indications for treatment are presented by the disease which begets the cutaneous disorder.

The local treatment of both the idiopathic and symptomatic varieties of the affection demands the use of external applications which will hasten the physiological reproduction of the epidermis, substituting thus new and unpigmented for old and pigmented epithelia. This process must also be accomplished without the artificial production of such an hyperæmia as will tend to add to the very coloration which it is attempted to relieve. The substances used for the slow accomplishment of this end are borax, sulphur, tincture of iodine,

¹ *Bibliotheca Medica* D. II., Part VI., 1896, W. C. Fisher & Co. (an illustrated monograph, giving results of his researches, and full bibliography); see also Ehrmann and Oppenheim, *Archiv*, 1903, lxx., p. 323 (report of further research, and complete bibliography).

potassium and sodium hydroxides (including the soaps of these alkalies), and the mercurials. None of these substances is more generally employed than corrosive sublimate, which constitutes the basis of most of the cosmetic lotions sold in the shops.

The following formulæ are given by White¹ for use in the evening. The preparation in each case should be left upon the affected surface during the night, and be removed by a soap-and-water washing in the morning. They are to be used for weeks in succession, but only after a cautious preliminary testing of the sensitiveness of the skin to their action. To avoid the possibility of error, the practitioner would do well to order a poison-label upon all vials containing the sublimate:

℞ Hydrarg. am. chlor., }	āā 3ij;	āā 8	
Bismuth. magister., }			
Amyl., }	āā 3ss;	āā 15	
Glycerin., }			M.
℞ Ammon. muriat.,	3ss;	2	
Aq. Colognien.,	f3j;	30	
Aq. dest.,	Oss;	240	M.
℞ Hydrarg. bichlorid.,	gr. vj;		4
Acid. mur. dil.,	f3j;	4	
Glycerin.,	f3j;	30	
Alcoholis, }			
Aq. ros., }	āā f3ij;	āā 60	
Aq. dest.,	f3iv;	120	M.

The following formulæ for ointments are given by Kaposi:

℞ Hydrarg. ammon., }	āā 3ss;	āā 15	
Sodæ biborat., }			
Ol. rosmarin.,	gtts. x;		66
Ungent. simpl.,	3j;	30	M.
℞ Acid. boric., }	āā 3j;	āā 4	
Cer. albæ., }			
Paraffin.,	3ij;	8	
Ol. amygd. dule.,	3j;	30	M.

Van Harlingen recommends:

℞ Hydrarg. chlor. corros.,	gr. vss;		4
Zinci sulphatis, }			
Plumbi subacetat., }	āā 3ss;	āā 2	
Aq. dest.,	f3iv;	120	M.

Sig. Lotion, for external use, morning and evening.

Other applications advised are: alcohol, followed by the use for several hours after, of a plaster of ammoniated mercury; 2 parts of magnesium carbonate and zinc oxide, 4 parts of pure kaolin and glycerin, and 10 parts of vaselin; chloroform 100 parts, chrysarobin 15 parts (Leloir); hydrogen peroxide; diluted acetic, carbolic, muriatic, and nitric acids; 1 to 2 parts of salicylic acid, in paste or powder, to 20 parts of base; and solutions of mercuric chloride in collodion, 1 part to 30, employed with great caution.

¹ Loc. cit.

The rapid removal of pigmented patches is accomplished, in Vienna, by covering the part with strips of linen dipped in an aqueous or an alcoholic solution of corrosive sublimate of the strength of 4 grains (0.25) to the ounce (30.), with which solution the dressing is also occasionally moistened. Vésiculation is usually accomplished in about four hours, when the serum is evacuated by puncture, and the detached epidermis is covered with an inert dusting-powder. The resulting crusts fall in about eight days. The procedure is attended with danger of producing in the end the precise deformity which it seeks to remedy, a danger explained above.

Another method of removing tattoo-marks and pigmented nævi, successfully employed by French dermatologists, consists in tattooing the region, previously rendered aseptic, with a solution of 30 parts of zinc chloride to 40 parts of water. If properly done, the resulting inflammation is slight, and after a few days there forms a superficial crust which remains about a week and then falls, leaving a slight scar which becomes almost imperceptible. This method succeeds in a few cases, but requires skill and care in its application in order to obtain good results and to avoid suppuration and deep cicatrization. The internal administration of potassium iodide, recommended for the removal of argyria, has often failed.

Prognosis.—The prognosis is in all cases uncertain. There is strong reason to believe that the local treatment of these dyschromias is, in the long run, ineffective. Those methods which effectually and brilliantly accomplish the desired end are almost invariably followed by deeper pigmentation than that which it was attempted to remove; those operating more slowly have, probably, a less speedy, but scarcely more disguised sequel. It is likely that local treatment of these pigmented states will ere long be abandoned. The treatment intelligently directed to the cause of each discoloration is that which in the end proves most satisfactory.

LEUCODERMA.

(Gr., λευκός, white; δέρμα, skin.)

(ACHROMIA, LEUCASMUS, PARTIAL ALBINISM.)

In the following pages the name leucoderma is employed to designate the pigment-atrophy which is partial and congenital; albinismus, that which is universal and congenital; vitiligo, that which is acquired.

In leucoderma, the patients being most often though not exclusively of the colored races, one or several whitish or rosy-whitish patches or bands, varying in size, outline, or situation, and unprovided with pigment, may be seen at birth. These patches may have a symmetrical arrangement, in which case they commonly observe the areas of distribution of one or more cerebral or spinal nerves; or they are asymmetrical in distribution. They are usually of circular

outline, and may be found upon the scalp, face, nipple, breast, and genital and other regions. The hairs found upon such parts are equally destitute of normal color, being usually white. Negroes thus marked are generally termed "piebald" and the integument similarly affected in persons of other races has long been recognized as the "pied" or "piebald skin." These blemishes when symmetrical, like pigmentary nævi, exhibit a striking analogy with the symmetrical arrangement of the spots, bands, and stripes to be recognized in the furs of many of the lower animals. The outline of the patch may be abrupt, or it may gradually shade into that of the adjacent integument. At times islands of pigmented skin are visible within the non-pigmented areas. The changes in these patches during later life may be insignificant, or they may individually increase in size with age, or even multiply. Rarely they regain pigment in later life. In no case is there an excess of pigment deposited at the border of the patch.

This condition is practically remediless.

ALBINISMUS.

(Lat., *albus*, white.)

(COMPLETE CONGENITAL LEUCODERMA, CONGENITAL LEUKASMUS, CONGENITAL ACHROMIA, CONGENITAL LEUKOPATHIA.)

Symptoms.—The term albinismus is here limited to the congenital conditions of achromia induced by universal absence of cutaneous pigment.

This deformity is peculiar to individuals known as "albinoes" (Kakerlaken; Dondos), isolated instances of this anomaly occurring in all races, but more frequently among those having normally a hyper-pigmentation of the skin, such as negroes. In the subjects of this anomaly the skin has a milky-whitish, transparent, or rosy-tinted hue, and is usually of delicate texture; the hairs are silky and yellowish, reddish, whitish or snowy-white in color; the iris transparent or pinkish; and the pupil, in consequence of defect of pigment in the choroid, is also reddish or pinkish. There are, as a result, nyctalopia and heliophobia, with frequent nictitation; pupillary variations, and the semblance of myopia. The pinkish hue of the skin in these individuals is due only to its translucency and vascularity. The defective condition of the pigment is usually unchanged throughout life; but in no other respect, save as to pigment-anomaly, does the skin of the healthy albino indicate disease.

Many persons thus deformed, however, are far from vigorous. It has been observed that some albinoes are physically inferior to the average of persons of the same sex, both in stature, weight, mental activities, and powers of resistance to disease. There are, however, numerous striking illustrations of the reverse of this, and we have had under observation a number of albinoes in one family in which

alternations of non-pigmented with normally pigmented children exhibited no difference whatever in sturdiness and vigor. Many enfeebled albinos are simply illustrations of the wretchedly unwholesome life of persons imported for exhibition into foreign countries.

Etiology.—Inheritance is evidently a strong factor in the production of this and similar pigment-anomalies. Alternations in birth of white and of black children in one family are recorded, yet it is unusual to find albinos in two succeeding generations, an occurrence of no great rarity in inherited affections.

The condition is remediless; it has been suggested that transfusion with the blood of a vigorous black-skinned African might modify the color-characteristics of the pure albino.

In Marcy's¹ report, a black father and mother had first two black male infants, then two female albinos, then a black female child, and, lastly, a male albino. We recently exhibited in our clinic twin albinos, children of Irish parents. In Sym's² cases, the first, third, fifth, and seventh children were albinos.

VITILIGO.

(Lat., *vitium*, a blemish.)

(ACQUIRED LEUCODERMA, LEUKOPATHIA, LEUKASMUS, ACHROMIA, PIEBALD SKIN.)

Vitiligo is an acquired cutaneous achromia, exhibited in single or multiple, variously shaped and sized patches, unaccompanied by textural changes in the skin, and usually bordered by tissues exhibiting pigmentary excess.

Symptoms.—This disorder of the pigment of the skin is one observed among the several races, often in the negro, and not rarely among those of Aryan descent. It commonly occurs without the slightest appreciable disorder, subjective or objective, save that betrayed to the eye in the color-changes of the skin. One or several rounded, oval or very irregularly shaped, smooth, and well-defined, pale or milky-white lines, streaks, or disks appear, often bordered at the periphery by an integument which assumes a light- or dark-brown or chocolate shade, this hue being by contrast most noticeable immediately at the contour of the patch, and imperceptibly fading into the normal color of the outlying integument. These patches are neither elevated above nor depressed below the general level of the integument. The patches may be few, numerous, or in rare instances coalesce to the point of producing a generalized albinism. The hairs or lanugo-filaments growing from the affected area may or may not be blanched; most commonly they are, a condition particularly conspicuous when, as is not rarely observed, a vitiliginous disk extends from the back or the side of the neck well into the

¹ Amer. Jour. Med Sci., 1839, xxiv., p. 517.

² Trans. Lond. Ophthal. Soc., 1891, xi., p. 218.

scalp, in which case the outline of that portion of the scalp involved is clearly defined by the whitened pilary growth. Lesser describes a condition termed by him *Peliosis Circumscripta Acquisita*, in which the hairs were thus blanched in a single area of an unaffected scalp, an observation confirmed in many cases.

The most common seats of the disease are the face, the neck, the backs of the hands, the genitals, the trunk, and the extremities. Upon the backs of the hands the disfigurement is usually more conspicuous in summer than in winter, a circumstance which probably ex-

FIG. 92.



(Copyright, 1900, G. H. Fox.)

Vitiligo. (G. H. Fox's Atlas of Skin Diseases.)

plains the reported instances of recurrence and total disappearance of the disease in successive years. The changes are due to a deepening of the pigment in the normal areas on exposure to the sun, thus making a more striking contrast with the non-pigmented spots.

The course of the affection is exceedingly slow; there may be for years no apparent extension of any involved area or the achromia may progress by peripheral extension and by the coalescence of rela-

tively small affected areas until a large portion of the trunk, the thighs, the buttocks, or other part of the body is involved. Hall¹ reports the case of a dark mulatto who became "perfectly white," with the exception of a patch on the chin. Lévi² reports three instances of total disappearance of pigment. Hardaway,³ Simon,⁴ and Stelwagon⁵ also report cases in which the loss of pigment was general or complete. It not infrequently happens that the loss of pigment is so extensive on the face, hands, and other regions that the eye of the observer is struck no longer by the unusual whiteness of the involved

FIG. 93.



Vitiligo.

patches, but this whiteness being generalized and apparently that proper to the person, the remaining normal areas appear to be hyperpigmented. Patients with vitiligo frequently suppose that the whitened areas are normal, and the darker ones abnormally pigmented. Patients of lymphatic temperament and blonde complexion (often women in early adult life) occasionally will apply to a physician for relief of dark patches on the skin of the face. Examination discloses faint lines, ribbons, or streaks of pigment about one or both cheeks, the temples, or the lips. But careful scrutiny recognizes an undue whiteness of the skin, with exceedingly faint and irregular outline near or next to those pigmented portions of which complaint is made. In these cases care is necessary to make a diagnosis between vitiligo and chloasma.

The disorder shows a tendency to spread, though as a rule a limit is reached eventually, beyond which the atrophy does not progress. In exceptional cases the parts which have lost pigment again acquire it.

¹ Louisville Med. News, 1888, x., p. 148.

² Recueil de Mém. de Méd. de Chir. et de Pharm. mil., 1865, p. 193.

³ Manual Skin Diseases, 2d ed., p. 280.

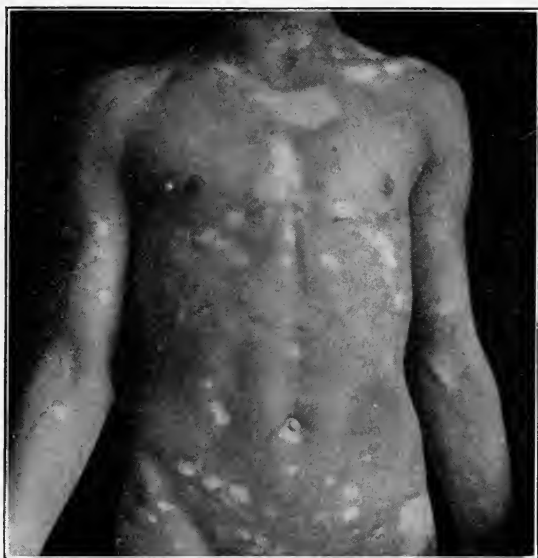
⁴ Deutsch-Klinik, 1881, p. 399.

Amer. Jour. Med. Sci., 1885, xc., p. 168.

The patch of skin from which the pigment has been removed is often exceedingly sensitive to the action of solar rays and to externally applied irritants chemical and other. It then exhibits a peculiar diffused pinkish shade of color occasionally with production of reddish papules, the disappearance of which never is followed by the pigmentation occurring in normal skin after marked hyperæmia.

In vitiligo, aside from the dyschromia, the skin is normal. Patients affected with vitiligo should be subjected to a careful general examination as there is usually a deviation from the normal in some or

FIG. 94.



Vitiligo.

gan of the body. In children it may occur as early as the fourth year of life (Crocker) and although not generally recognized in such cases it usually follows scarlet fever. It is especially apt to develop on lichen planus, scleroderma, syphilis, and leprosy.

In women it is most frequently observed as a manifestation of the menopause, it occurs in nervous exhaustion, myxœdema, asthma, in Graves's¹ disease even when the symptoms are not well marked, and also in association with some minor affections. A morbid mental condition, especially in women of middle life, often is produced when the disfigurement involves the facial region.

Etiology.—Although the etiology of the disease is unknown it may best be explained as stated by Gaucher² on the assumption that it is caused by toxins derived from some distant hidden or apparent

¹ Cf. Dore, B. J. D., 1900, xii., p. 353; Hyde and McEwen, Amer. Jour. Med. Sci., 1903, cxxv., p. 1000.

² Annales, 1902, s. iv., iii., p. 1113.

focus of disease. The disorder is of more frequent occurrence than dermatological statistics tend to show. Many persons who are the subject of vitiligo of an inconspicuous part of the body do not consult a physician with regard to the nature of the disease, as it occasions no physical distress.

Pathology.—The pigment normally present in the deep rete-cells is absent in vitiligo-spots, but greatly increased and deepened at the borders of the areas. In the corium are cells which contain pigment-granules. These are especially numerous at the margins of patches, where blood-vessels, follicles, and glands are surrounded by many

FIG. 95.



Vitiligo. (DOUGLASS W. MONTGOMERY.)

oval, stellate, and branched pigment-cells. The probable nature and origin of these cells are considered under Chloasma. Leloir and Chabins have demonstrated atrophy of the subdermal nerves in patches devoid of pigment. Other changes in the skin have not been noted.

Diagnosis.—The diagnosis is based on the achromia, with usually a hyperpigmented border, and the absence of other symptoms. In all typical cases the recognition of the disease is facile. The several chloasmata are distinguished by their failure to exhibit the distinctly outlined circular border of the characteristically developed vitiligo patch. Much attention has been given to the distinction between vitiligo and the leucodermatous patches of anæsthetic lepra, but a study of the macular lesions in the disease last named reveals

distinctly the presence of a systemic disorder with anaesthesia of the affected areas. *Morphœa* is a disorder of the skin accompanied by infiltration of the integument while vitiliginous patches are solely distinguishable by reason of the color-changes. The color, surface-scaling, and localization of *tinea versicolor* usually serve for its recognition, and the parasite always can be recognized by the microscope.

Treatment.—Much chagrin will be saved both physician and patient by practically regarding vitiligo as not amenable to treatment. Patients occasionally recover while under treatment, which, however, has contributed generally but little to the result. Arsenic and iron internally, recommended highly by some writers, have failed repeatedly to accomplish any appreciable results as regards dyschromia. By efforts directed to the removal of the hyperpigmentation in the border of the achromic patches the disfigurement may be lessened somewhat. The method of arriving at this end is described in connection with the treatment of *chloasma*. It is possible that further experimentation with hypodermatic injections of pilocarpine, that have in a limited number of cases been followed by disappearance of the disease, may warrant a less unfavorable view of the results of treatment. Savill¹ reported a return of normal color in vitiliginous patches to which he had applied pure carbolic acid. D. W. Montgomery² reports a case of vitiligo in which several applications of the Finsen light were followed by restoration of the normal pigment. We have tried the method in four cases with negative results.

Prognosis.—The health of the subject of the malady is not impaired. The disease is practically incurable, progressing usually until it has obtained a maximum of development; and then, as a rule, remaining unchanged throughout life.

¹ B. J. D., 1898, x., p. 99.

² J. C. D., 1904, xxii., p. 17.



CLASS VI.

NEW-GROWTHS.

CICATRIX.

(SCAR. *Fr.*, CICATRICE; *Ger.*, NARBE.)

A cicatrix is a new-formation of the skin, replacing connective tissue which has been lost by traumatism, by ulceration, or by some other pathological process. Most cicatrices, as, for example, those following the ulcerations of syphilis, the operations of the surgeon, or the dermatitis produced by a severe burn, are reparative in character.

Scars vary greatly in shape, size, color, and other features. They may be smooth, glossy, shining, scaling, dull whitish in color, or pinkish from vascularization of the surface. They may be linear, fan-shaped, circular, corded, ridged, dotted, crateriform, or tumor-like. They may be raised above the skin, on a level with it, or depressed below it. They may be deeply attached to periosteum or to bone, or readily be movable over the panniculus adiposus. They are of deeper color when young, and increase in whiteness with age. They are unprovided, as a rule, with hairs, or with coil- or sebaceous glands.

The most insignificant cicatrices are those resulting from clean, incised, and punctured wounds and lesions of similar grade. Certain peculiarities of cicatrices are seen in special disorders in which they are produced. Circular, oval, reniform, horseshoe-shaped, S-shaped, and figure-of-eight-shaped scars, thin and flexible, are characteristic of syphilis. The cicatrices of variola, zona, and ecthyma are slightly different each from the other, though all are of small size and depressed. Those of tuberculosis and dermatitis caloricæ of severe grade are exceedingly irregular and often corded.

Hypertrophy of cicatrices is the condition elsewhere described as keloid. Here there is a tumor-like development of the cicatrix, forming a ridge, button, knob, indurated fold, or puckered and irregularly circumscribed, whitish or reddish lesions. In certain individuals these lesions may follow almost every traumatism and destructive process to which the integument is liable.

A case of cicatrix undergoing involution has been described by Dyce Duckworth, in a man (aged fifty) who suffered from rheumatic fever on two occasions, ten years before the date of report. This patient had pericarditis, and was blistered over the precordia. Nine months afterward lines of cicatricial growth began to form in the scar left by the blister, and they rapidly extended; in two years' time

they were still enlarging; in seven years some subsidence was noticed, and, when exhibited ten years after their first formation, involution was markedly progressing. This case illustrates the frequent origin of scar-tissue, its common occurrence over the sternum, and the fact of the subsidence of the new-growth in the course of time.¹

Keloid-like cicatrix of the cheeks following acne is far from uncommon. Its lesion is usually smoothed down in the process of time, after the disappearance of the sebaceous gland-disorder, until the deformity is lessened greatly, and often scarcely noticeable. Colloid degeneration occurring in scar-tissue and producing lesions which clinically resemble those of xanthoma is described by Juliusberg² and Dubendorfer.³ We have seen this condition twice—once in the scars of syphilis and once in those of tuberculosis.

Etiology.—The formation of cicatrix is always preceded by destruction of at least a portion of the papillary body of the corium. This loss of tissue may be due to various causes: trauma, burns, ulcers, atrophy caused by pressure of new-growths, etc. Hypertrophied cicatrix may result from slight but continued or frequently repeated irritation of a healing surface, the repair of which is thus greatly delayed, but it occurs chiefly in the form of cicatricial keloid.

Pathology.—Histologically, scars are made up of connective-tissue bundles which interlace in all directions with great irregularity. In young scars the fibres are finer and the tissue is vascular, but as the scar grows older the fibres usually become coarser and contract and the vessels disappear. There is complete absence of hair-follicles, glands, and furrows of normal skin. The scar-tissue proper is covered with a very thin epidermis, and Heitzmann claims that shallow and irregular papillæ are always present. Other observers report in scars an entire absence of both papillæ and rete-pegs.

Diagnosis.—The distinction between hypertrophied cicatrix and keloid is one chiefly of degree and needless from a practical point of view.

Treatment.—The resources of modern surgery are to be trusted in the production of laudable cicatrices when all antiseptic precautions are observed. The treatment of pathological conditions likely to be followed by cicatrices is the treatment largely of the special disease in which such loss of tissue occurs, *e. g.*, the ulcer left by a degenerating syphilitic gumma of the skin. An irregular or disfiguring cicatrix may be excised if there be sufficient tissue to permit direct union on either side. Skin-grafting may be employed after excision of larger scars. Radiotherapy has given good results in some cases, producing, through absorption of the tissue, a softer, thinner, and smoother scar than the original. Injections of thiosinamin have been successful in a few instances. Further details are given under treatment of keloid.

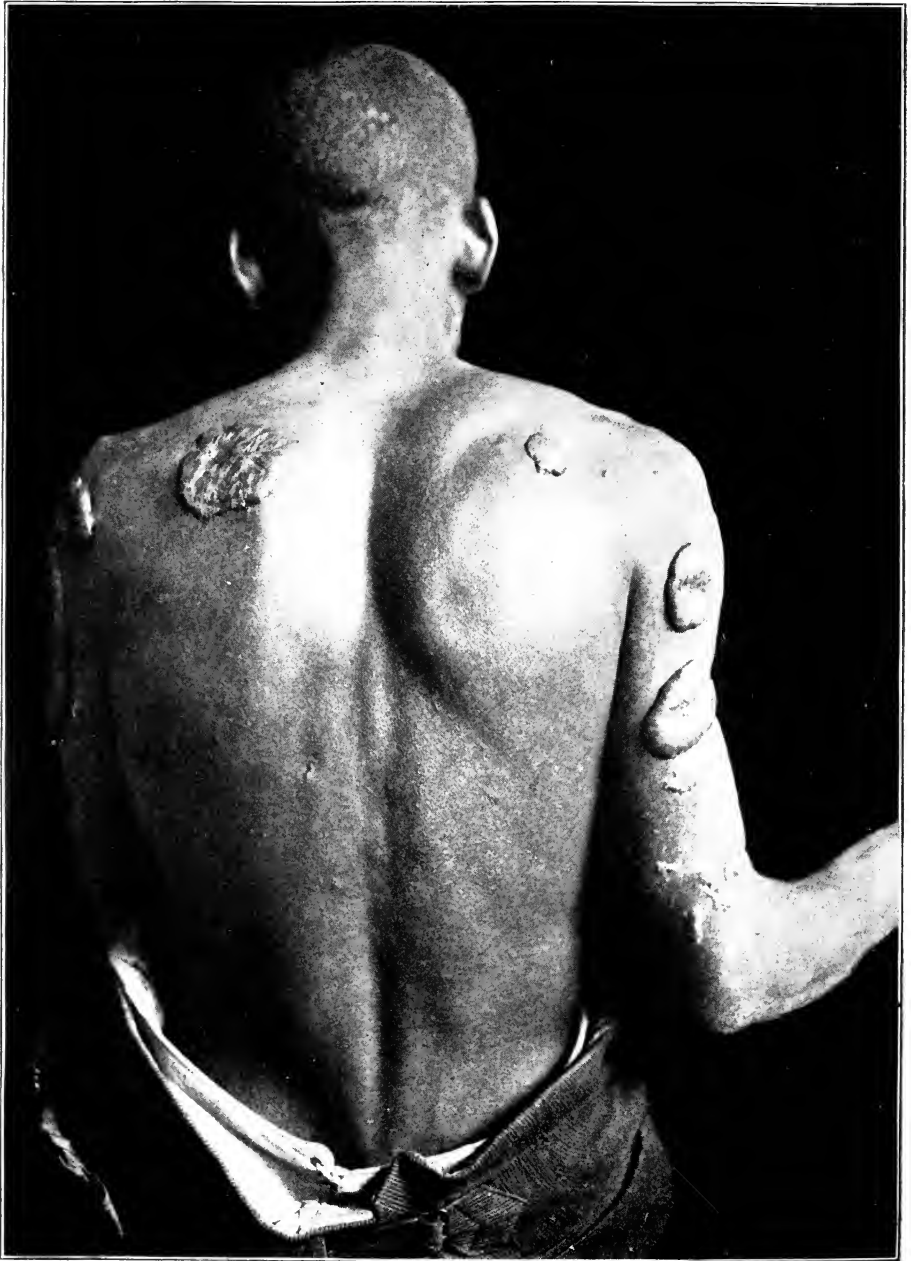
¹ Brit. Med. Jour., 1881, ii., p. 597.

² Archiv, 1902, lxi., p. 175 (with bibliography of colloid degeneration, and of pseudoxanthoma).

³ Ibid., 1903, lxiv., p. 175.



PLATE XXIV



Keloid in the Negro.

KELOID.¹(Gr., *χηλῆ*, a crab's claw.)(CHELOID, KELIS. *Fr.*, CHÉLOÏDE, CANCROÏDE; *Ger.*, KNOLLENKREBS, ALIBERT'S KELOID.)

Keloid is a neoplasm of the derma usually following trauma, developing as one or multiple fibro-cellular elevations of the skin, irregularly shaped, smooth or corrugated, whitish or reddish in hue, and resembling a thickened and hypertrophied cicatrix.

The term keloid, first given to the disease by Alibert, should be restricted to it exclusively. The so-called "keloid" of Addison is known to-day more properly as scleroderma.

Authors have described two varieties of this disease: the "true," "spontaneous," or idiopathic form; and the "false," "spurious," or cicatricial form, which develops in the scar produced by a previous traumatism.

There is no anatomico-pathological separation between the two. Cases of so-called "spontaneous keloid" are instances of development, of the growth in regions of pressure, contusion, traction, or slight traumatisms that have not been recognized, such as the wounds inflicted by mosquitoes. Reiss² reports a case in which more than two hundred small keloid growths appeared over the chest and flexor surfaces of the extremities of a healthy girl, twelve years of age, without preceding cutaneous lesions or traumatisms.

Symptoms.—The new-formations of this disease are dense, generally elastic nodules imbedded in the corium or projecting above the level of the skin and firmly attached to it. They are usually slow of evolution, and, having once attained full development and assumed one of the several shapes which they affect, often persist for a lifetime. These forms are whitish or reddish, globular or semi-globular nodules, buttons, or plaques with roundish or ovoid outline; linear elevated striæ, bands, ridges resembling cords, ribbons, or tapes, in irregular outline and disposition; or combinations of two or more of these figures. A common form over the sternum and in other situations where the development of the growth in every direction is not impeded, is that of a larger central mass with two or more diminishing and declining prolongations bearing a remote resemblance to the body and claws of a crab. The lesions vary in size from that of a small pea to that of a large plate, the largest including the outlying points of the limbs or radiating ridges. Over them the skin is reddish or whitish in color, smooth, hairless, and occasionally hypersensitive to pressure and heat. Often blood-vessels traverse its surface. The growth at times is also the seat of spontaneous pain.

The most frequent site of the disease is the anterior surface of the

¹For review of subject, with bibliography, see Reiss, *Archiv*, 1901, lvi., p. 323; Berliner, *Monatshefte*, 1902, xxxiv., p. 321; and Tschlenow, *Zeitschrift*, 1903, x., p. 120.

²Loc. cit.

chest, but it is observed also upon the face, neck, ears, breast, hands, between the scapulæ, and on the extremities (Fig. 96). Keloid is also seen upon the penis of the negro. It is far more common in the colored than in the white races. Though frequently multiple, there are rarely more than a score of these growths visible at one time upon the skin of one person.

The overlying integument at times may be uncolored wholly in the white races, and dead whitish in color or even blackish among negroes. At other times the surface is not merely pinkish or reddish, but is vividly red in hue. The color is produced by vascularity of the growth. The subjective sensations aroused are commonly trifling or inappreciable; at other times the growths are the seat of severe pain or of burning. The usual course of the disease

Fig. 96.



Keloid.

is toward the production of tumors of a medium size, after which few changes are to be recognized. Involution and complete disappearance are rare. These results, however, have been secured in a few cases.

Cicatricial Keloid (*Scar-keloid, Hypertrophic Scar, Hypertrophic Cicatrix*) is a term employed to denote that the lesion has been pre-

ceded by scar-formation, due either to disease or to injury. It thus follows the lesions of zoster, variola, and syphilis, as also traumatisms of all sorts, including those made by surgical operations and accidents. The presence of a large number of small scattered keloids suggests to the mind of the experienced clinician the frequent use of the hypodermic syringe, as keloids form at the point of puncture of the hypodermic needle.

It is not every scar even in susceptible individuals which becomes hypertrophic. The tumors, as a rule, spring directly from scar-tissue, and after reaching a maximum of development do not surpass the

FIG. 97.



Hypertrophic scars (keloid) following burn.

limits of the original lesions; at times, however, the growths slowly develop at a distance from the original site of injury or disease. Scar-keloid often is found as a firm nodule in the lobe of each ear among women, after piercing the ears for the insertion of earrings; it is seen also not rarely as a result of burns, whether produced by application of caustic agents or of heat.

Lesions of this kind rarely develop symmetrically. They may be counted at times by the hundred; commonly but one or two are seen in one person. They may persist after reaching a maximum development, or spontaneously, wholly or in part, disappear; or ulcerate; or become the seat of malignant growths.

Acne-keloid (see *Dermatitis Papillaris Capillitii*) is a term descriptive of acneiform lesions over the nucha and scalp, the symptoms including those related to changes in the hair-pouches and con-

tained hairs. Acne, both of the face and back, of severe grade and unusual persistence, often leaves minute multiple and somewhat deforming keloid growths where the sebaceous glands have been implicated most seriously.

Etiology.—The origin of the disease is exceedingly obscure. Neither age, sex, nor previous disorder of the skin seems to have any

FIG. 98.



Hypertrophic scars (keloid) following burn.

bearing upon its production. It is seen in remarkably vigorous persons (more often in the negro race), but also in those who are weakly. The very young and very old are more rarely affected.

Though not yet demonstrated, it is probable that eventually some varieties of keloid will be recognized as examples of cutaneous paratuberculosis, the predisposition to the development of the disease in sites of slight traumatism being related to the toxins furnished from a distant focus. The race in which its lesions are most often and most voluminously displayed is exceedingly prone to tuberculous infection; and the frequent recurrence of the disease after surgical excision and the peculiar lupoid aspect of certain keloid lesions are strikingly suggestive.

Pathology.—According to Langerhans, Warren, Kaposi, and others in all cases of keloid the papillary layer of the corium and the interpapillary projections of the rete downward are intact, the new

formation being strictly limited to the middle and lower portions of the corium, in which there are numerous whitish, tendinous fibres of connective tissue, dispersed for the most part parallel with the surface of the rete. In cicatricial keloid these observers find a partial or complete absence of the papillæ and interpapillary processes. Babes, Crocker, and others, on the contrary, find that the papillæ and rete may be normal, modified, or absent in either form. Lymph-vessels with proliferated endothelium, compressed by longitudinal growth of the fibres, pass in both vertical and horizontal planes, for the most part remaining pervious. There are few spindle-cells and nucleated cells. Blood-vessels are few in the centre of the tumor, but are numerous at the border and in the loose connective tissue surrounding the growth. For some distance beyond the tumor the adventitia of the vessel shows a small-cell-growth which probably develops later into spindle-cells and fibres. These, with the included tissue of the corium, form the keloid. The sebaceous glands and coil-glands, hair-follicles, and muscles are pushed to one side by the new growth and often are atrophied.

Diagnosis.—The situations of the lesions of keloid, often over the sternum, the infrequency of multiple tumors, its claw-like prolongations and yellowish-white, reddish, or grayish-white color, all point to the nature of the disease.

Treatment.—The most satisfactory treatment for keloid and hypertrophic scars is found in radiotherapy. Ullmann, Taylor, Pusey,¹ and others report instances in which a keloid or thick scar has been removed wholly or in part by the use of the *x*-rays. In more than a score of cases of true keloid and of hypertrophic scars, in which we have tried the method, the improvement has been altogether satisfactory. In 2 instances in which the scars, due to burns from steam, were extensive and very disfiguring, fourteen and sixteen treatments respectively produced a gradual disappearance during the following six months, of the entire thickness of the growth, leaving soft, pliable scars. Removal of keloid by cauterization and excision is not to be practised, as the growth commonly does not fail to reappear. Vidal successfully employed multiple linear scarifications. Various stimulating applications may also be made with a view to promote resorption, such as the spirit of green soap, iodated glycerine, iodine in ointment and tincture, and mercurial, salicylated, and lead plasters. The employment of these remedies is subject to the danger of stimulating the growth to greater activity. Where there is pain anodyne unguents may be employed topically, such as freshly prepared belladonna plaster, or ointments of belladonna, stramonium, and opium. By far the most elegant of these, and the one which also is capable of producing an alterative effect, is the oleate of mercury and morphine. Laurence² obtained good results by scarification followed for several weeks by moderate pressure produced with adhesive plas-

¹ The Röntgen Rays in Therapeutics, p. 558.

² Brit. Med. Jour., 1898, ii., p. 151.

ter. Ularic and others report successful destruction of keloid with injections of 5 to 20 per cent. solutions of creosote in olive oil. Electrolysis has given good results in a few cases. Tousey, Newton, Crocker,¹ Neisser, and others report excellent results from injections along the growths of from 10 to 20 minims (0.66–1.33) of a 10 per cent. solution of thiosinamin in equal parts of glycerin and water, or in alcohol.

Internally, quinine, strichnine, arsenic, and potassium iodide have been exhibited with varying success.

Prognosis.—As regards the general condition of the patient the prognosis is favorable. Very rarely there is spontaneous resorption of the nodule or tumor. Generally the latter may be expected to persist, after full evolution is attained, for an indefinite period of time.

FIBROMA.

(Lat., *fibra*, a fibre.)

(FIBROMA MOLLUSCUM, VON RECKLINGHAUSEN'S DISEASE, NEURO-FIBROMA.)

This disease is a developmental defect, manifesting itself by the presence of tumors of the skin and other organs of the body; pigmentations of the skin and mucous membrane of the mouth; and by defect in the mental development. One or both of the two last-named symptoms may be absent.

Symptoms.—The tumors are usually numerous and scattered irregularly over the entire body. They are from pea- to egg-sized and vary greatly according to their age and dimensions. In early development they present dome-shaped pea- to bean-sized elevations which are softish, semisolid, or pasty, with a normal epidermal covering. Later they are cone-shaped, semi-solid formations, sometimes capped by an opaque summit which presents the appearance of a vesicle and which bleeds freely when pricked. Digital compression causes these tumors to disappear through a ring in the skin and when released they spring back into their normal position. Old tumors are less gelatinous, are firmer, harder, and mammillated, often pedunculated. Small-sized tumors may recede, leaving an empty pouch of skin. When egg-sized, the tumors are usually subcutaneous, and are less lobulated than fatty tumors. When diffuse, especially in the face, they draw the skin into extensive folds (fibroma pendulum). Occurring about the anus they present folds of tissue which resemble the labia minora vulvæ and which annoy the patient in defecation. They are not painful when touched and they produce no subjective symptoms. In a given case tumors of all sizes and in all stages of development may be present. When very large, there may be a single tumor present, which may be more or less peduncu-

¹ Diseases of the Skin, 3d ed., p. 942.

PLATE XXV



Multiple Fibroma of the Back.





PLATE XXVI



Fibroma Pendulum.

lated. The tumors may affect the mucous membrane of the mouth, large nerve trunks (sciatic nerve), suprarenal capsule, intestines, and other internal organs. Patches of leucoderma, telangiectasia, patulous orifices of sebaceous glands, comedones, and fatty tumors are not uncommon.

Pigmentations are usually light- to dark-brown colored freckles sprinkled over the entire cutaneous surface together with a few large patches of pigmentation; jet black points of pigment are sometimes observable in the larger areas. The freckles may be discernible in the negro.

Oddo¹ has reported two cases in which there were pigmentations of the mucous membrane of the mouth, resembling those commonly observed in the mouths of dogs. Weber² and a few others have reported anomalous cases of cutaneous freckles and patches of pigmentation which they believe are cases of Von Recklinghausen's Disease.

Hebra called attention to the low standard of physical and mental development of the subjects of the disease seen by him; a fact observed by many and well illustrated in a case recently presented in our clinic, the patient being an exceedingly myopic, poorly nourished white male dwarf, whose body literally was covered with fibromata from scalp to the feet.

Etiology.—Von Recklinghausen's Disease is peculiar to neither sex. It cannot be claimed as the disease of any special race but it is more common in the negro than in the white race. The disease may be present at birth or it may appear at puberty or even in early adult life. The most striking fact regarding the etiology is its sudden appearance following any severe tax on the system, such as the first menstruation, pregnancy, or disease of such severity as malaria, dysentery, or pulmonary tuberculosis. It may develop in the absence of these predisposing factors. The hereditability of the disease is made probable by the observation of cases in which other defects of development were present, and also of families where several members were afflicted, as well as those in which the disease occurred in three successive generations.

Pathology.—Under the microscope the tumor is seen to be a variety of myxo-fibroma; the cells are spindle-shaped and round, and have a marked nucleus and gelatinous protoplasm. They are seen when quite young to originate from sebaceous glands, sweat glands, or other parts of the derma. As they become older the outer layers of the tumors develop into coarse fibrous tissue, while the central part remains gelatinous. Von Recklinghausen showed that the tumors developed from nerve-sheaths and that they actually contain nerve-filaments (neuro-fibroma).

Diagnosis.—The tumors of molluscum fibrosum are to be distinguished clinically from multiple cutaneous sarcomata by the violaceous or reddish color of the latter, the absence of pedunculation, the

¹ Annales, 1906, s. iv., vii., p. 803.

² B. J. D., 1905, xvii., p. 226.

greater tendency to ulceration, and their evidently malignant character. From tubercles of lepra they are differentiated by the entire absence of constitutional impairment and their general development in far greater multiplicity. The tumors of molluscum epitheliale differ in their contents, their superficial location, and in the frequent presence of the dark puncta at their summits.

Neuroma is usually painful; lipoma less frequently multiple and pedunculated, and more suggestive, when handled, of a "pillowy" sensation to the touch. Warty growths are readily distinguished by their verrucous summits; and the gummata of syphilis, by the concomitant or prior symptoms of the existence of lues.

Treatment.—The treatment of large single fibromata is surgical, involving the employment of knife, ligature, écraseur, or galvano- or thermo-cauterization. Multiple lesions are often so numerous as to forbid such interference. When there is a distinct vice of development or inherited tendency to the disease little can be accomplished in the way of treatment.

Prognosis.—Rarely, one or more of these lesions disappear by spontaneous involution. More commonly they persist after their evolution is completed. Marasmus, tuberculosis, and a fatal result may occur. One or several of the tumors may become sources of danger from the occurrence in them of an active inflammation with resulting degeneration and septicæmic consequences. The disease, however, does not in many cases shorten life. In general the prognosis of multiple fibromata may be regarded as unfavorable.

FIBROMA SIMPLEX.

(ACROCHORDON, SOFT WARTS. *Fr.*, VERRUES CHARNUES.)

This is a term applied to fibroma molluscum when the tumors are few in number and of small size. The first appearance of the disease sometimes may be recognized as a roundish spot over which the skin is uplifted. It is of a light-pinkish color. The tumor is soft and suggests to the touch a thinning of the derma beneath. The tumors may undergo involution but this result is more common when the patient is under thirty years of age. Dermatology is produced by great activity of the growth of one, or fusion of several, tumors, by which a flap of skin is formed.

Some of the tumors, usually in young subjects, suggest, when handled, a vermiculous content. The soft and gelatinous quality of the neoplasm in early life is believed to be proportioned to the age of the subject; rapidity of development and succulence of structure are simply conditions of imperfect evolution, and are not common in older patients, in whom the tumors are firmer and grow more slowly.

When involution occurs after maturity of the lesions has been attained the softish contents of the tumors become adherent to the cutis above, and the cutaneous atrophy is proportioned to the rapidity of development of the growth and the firmness of its structure. Then

ensues a purse-like pedunculation of the tumor, produced by encroachment of the skin upon its pedicle, rendering invagination, supposably possible before, afterward difficult or impossible. Gradually thereafter the neoplasm loses its skin-connection. Eventually in many cases only fibrous cords are left, evidently attached to the connective tissue beneath, the skin-color paling as the vascular tension correspondingly diminishes. Soon the dermal foramen closes, and the involutive process is at an end. Then empty and wrinkled pouches or purses of integument are left, the further shrinkage of which produces multiple warty or nipple-like elevations of tissue (under the microscope recognized as fibrous structures with an epithelial envelope), much in color like the virgin nipple or the scrotum of a boy. From four months to a year are requisite for the mature development of the tumors, and nearly as long a period for the completion of the process of involution.

DERMATOLYSIS

(CHALAZODERMIA, PACHYDERMATOCELE, FIBROMA PENDULUM, LAX OR RELAXED SKIN)

is a condition which may be congenital, or which, as appears in what precedes, may be produced by fibroma and follow involution of its lesions. In other cases it is apparently spontaneous and diffuse, but then it is probably the result of some preceding condition that has been unnoticed. The skin of patients thus affected is in a condition resembling that of the young of several of the larger among the lower animals (pups of large hounds, etc.), where enormous flaps of skin may be gathered up between the fingers and extended a foot or more from the underlying tissue. On releasing such folds the skin retracts to its former position. The skin in these cases usually is thickened, but it may be stretched to a considerable tenuity, as in the case of a man lately exhibited who could cover his face with skin drawn up from the surface of the chest. The integument may be externally normal to the view or pigmented. It may be the seat of molluscous tumors; and either insensitive or normally sensitive, or the seat of painful sensations. Usually all the functions of the integument are preserved.

The anomaly is always partial and limited to either the face (the lids), the neck, the chest, the belly, or the genital region. The disease may be congenital or acquired.

Dermatolysis, as thus recognized, is to be distinguished from the laxity of skin apparent in the senile condition and after distention from the presence of tumors, pregnancy, etc. Usually, however, in the last-named group of cases it is the subcutaneous tissues which are relaxed rather than to any unusual extent the skin itself (*e. g.*, the mammary glands of women of advanced years, and the abdominal muscles after distention of the belly).

PARAFFIN PROSTHESIS.¹

Since injections of paraffin have been practiced by many so-called "dermatological institutes" to remove wrinkles, form dimples, and otherwise change the natural contour of the face to suit the fancy of the patient, many untoward results are annually presented to the profession for correction. The proportion of patients who become victims of the peculiar new-growths that sometimes follow such injections cannot be stated, but it appears to be small compared with the large number treated. Surgeons have for several years employed paraffin, to replace lost tissue. Since Gesuny first injected a quantity of paraffin, having a melting point of 40° C., into the scrotum

FIG. 99.



Paraffin prosthesis (cutaneous and subcutaneous lesions following).

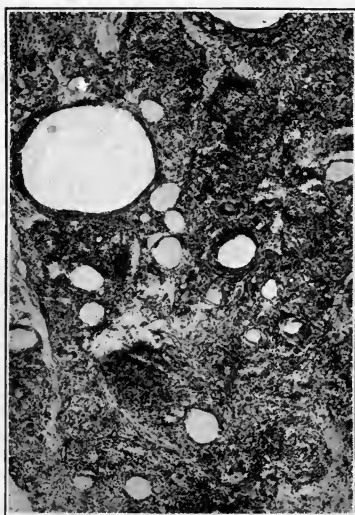
to replace lost testicles for the purpose of hiding the deformity for a candidate who contemplated taking the physical examination for entrance into the army service, surgeons have utilized the method to

¹ Literature: Heidingsfeld, M. F., *Histopathology of Paraffin Prosthesis*, J. C. D., 1906, xxiv., p. 513 (with many references); Ormsby, Oliver S., *Tumor Formations Following Paraffin-Injections*, J. C. D., 1907, xxv., p. 277; Williams, A. W., *Paraffinomata*, B. J. D., 1907, xix., p. 432.

overcome various deformities. It has been used in the correction of sphincter incontinence, in hernia, to separate nerve ends, to correct cleft palate, and many facial deformities especially those about the nose. It is to the cases where unsightly new growths occur about the face following its use, that this chapter is devoted. The following is a description of the clinical and pathological findings in four patients we have had under observation and treatment.

There is commonly a period of time varying from six to fifteen months in which the tissues apparently do not rebel at the presence of the foreign material; then the new growth begins. The sites of these deformities are usually at the angles of the mouth about the chin, near the junction of the wings of the nose with the face, between and beneath the eyes, and on the upper part of the neck. The masses

FIG. 100.



Section from tumor induced by paraffin. Low power showing Swiss-cheese appearance and cellular infiltration.

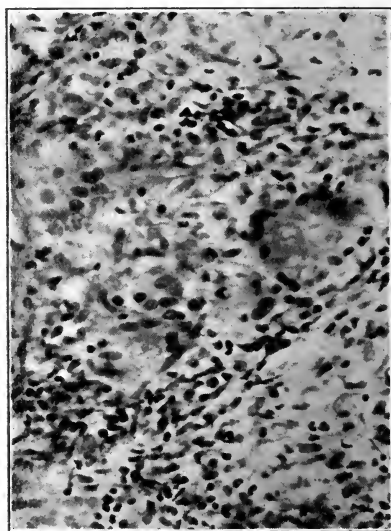
vary in size from that of a pea to a hen's egg and larger. They are firm in consistence, attached to the overlying epidermis, and embedded deeply in the subcutaneous tissues. They are bluish-red in color, at times brownish-red, often covered with dilated blood-vessels; at times they appear not unlike keloid. They are as a rule unaccompanied by subjective sensations, but occasionally some discomfort is experienced due to the pressure over the bony prominences. When occurring near the angles of the mouth, the prominence extends into the oral cavity, producing bulging of the buccal mucous membrane. Edema of varying degree is present in the surrounding tissues. The deformity produced in some of these patients is disfiguring to a high degree and practically forbids their appearance among their fellows.

Histopathology.—The tumor is essentially a connective tissue new

growth, resembling to a high degree the granulomata. With the low power of the microscope it presents a series of oval and round cavities not unlike well aerated Swiss cheese, as described by Heidingsfeld. These cavities represent spaces formerly occupied by the paraffin which penetrated the tissues in numerous fine channels. The larger spaces probably were produced by the paraffin having been deposited in masses by rupture of the tissue. In addition to the fibrous bands and multi-nucleated cells groups of connective-tissue cells are found. It appears probable that owing to the highly vascular tissue in these areas, the foreign material is not incapsulated to such a degree as when deposited in the purely fatty tissue, such as occurs when used in some of the regions referred to above, where surgeons employ it for cosmetic or other purposes.

Diagnosis.—The lesions resemble keloid and at times even lupus vulgaris. The hardness of the growth and the absence of the soft,

FIG. 101.



Section same as Fig. 100. High power showing giant and other cells.

apple-jelly, brown nodules of lupus distinguish it from this disease. The peculiar conformation, color, and size of the masses, together with the history of previous treatment with paraffin serve as distinguishing features of the disease.

Treatment.—Complete excision surgically, followed by radiotherapy has given best results. The paraffin must be totally removed or recurrence happens. Many other methods have been tried without success.

Prognosis.—Sufficient time has not yet elapsed to determine the result in an untreated case. It seems probable that malignant degeneration would not result. The logical outcome would most likely

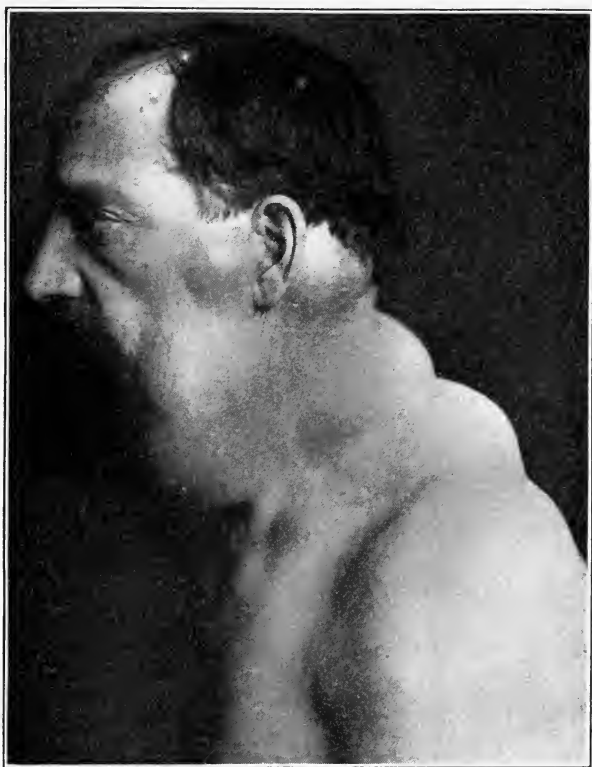
be the ultimate casting off of the affected tissue by secondary infection. The deformity is intense in some cases and causes the patient much suffering and remorse.

LIPOMA.¹

Fatty tumors occur in the corium and subcutaneous tissues and viscera and are composed of fat cells similar to those found normally. It is to those growths occurring in the corium and subcutaneous tissue that this chapter is devoted.

Symptoms.—These tumors may occur singly or as diffuse masses. The commonest sites are in the subcutaneous tissue over the shoulders and back. They also occur in the neck both anteriorly and posteriorly, in the breast, gluteal region, and rarely on the face, scalp, scrotum, and labia. They may be small and flat, or nodular and lob-

FIG. 102.



Lipomata (fatty neck).

ulated, and vary in size up to that of a man's head. As a rule the base is broad, but at times a pedunculated tumor is formed by the weight of the mass narrowing its base. The skin over the tumors is

¹ Cf. Loxor-Bevan, General Surgery, pp. 796-805.

usually normal in color or slightly pigmented, and may be normal in thickness. The lobulated condition which is characteristic of these growths may be evident to the eye when they occur near the surface. As a rule no subjective sensations are present, but at times through pressure on the nerves some pain is experienced. Secondary changes at times occur in the larger tumors such as calcification, ossification, œdematous changes, and liquefaction—oily cysts are thus sometimes found. The skin over the growth may necrose when secondary infection occurs, producing putrefaction.

That these tumors, though composed of fatty tissue similar to the normal, are independent of the general nutrition is shown by their persistence in wasting diseases (Virchow). They usually grow slowly and cause little inconvenience, but the small multiple and symmetrical variety often develop rapidly.

Etiology and Pathology.—They are rarely congenital and usually develop between the ages of thirty-five and fifty years, and occur most commonly in the female sex. They are composed of groups of fat cells which are slightly larger than the normal, held together by a capillary network forming small lobules. These are not so distinct as in normal fatty tissue but are united by connective tissue trabeculae into lobes and differently shaped masses. These tumors are enclosed within a connective tissue capsule. The lobules are said to "bear the same relation to the nutrient artery as grapes do to the stem upon which they grow."

Diagnosis.—The important points in diagnosis are the position of the tumors, their slow growth, mobility, lobulation, and consistency.

Treatment.—The treatment consists in complete extirpation by surgical means.

Prognosis.—They are benign and do not recur after complete extirpation. They commonly grow to a given size, then remain stationary for years.

ADIPOSIS DOLOROSA.¹

(DERCUM'S DISEASE.)

This disease is commonly classed as a sub-variety of obesity and is briefly referred to here for the reason that in some particulars the lesions resemble lipomata. It is a "disorder characterized by irregular symmetrical deposits of fatty masses in various portions of the body preceded by or attended with pain." It occurs near middle life and in woman. The fatty deposits may occur as large masses which are soft in consistency. The hands, face, and feet are exempt. Its true nature is unknown. The neuralgic pains associated with fatty deposits are characteristic. Thin² describes two forms of multi-

¹ Dercum, Amer. Jour. Med. Sci., 1892, p. 521.

² P. Thin, Adiposis Dolorosa and Painful Symmetrical Lipomata, Monatshft., 1903, xxxvi., p. 281; abstr. J. C. D., 1903, xxi., p. 292. Osler, Modern Med., 1909, vi., p. 570.

ple painful lipomata which he believes are closely related but not identical.

NEUROMA.¹

(Gr., νεῦρον, nerve.)

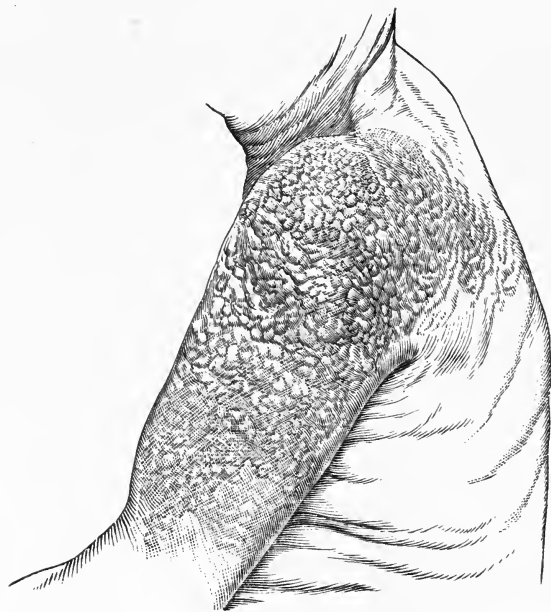
(TUMOR OF THE NERVES. *Fr.*, NÉVROME; *Ger.*, NEUROM.)

Neuroma is a new-growth consisting of one or several tubercles developed in the skin and composed of elastic, fibrous, and connective tissue with fibres of nerves.

Symptoms.—The description appended is a summary of the symptoms detailed in the reports of Duhring,² of Rump,³ and of Kosinski⁴ of cases of neuroma affecting the skin primarily.

The patients were all men of middle life or advanced years, who exhibited upon the shoulders, arms, thighs, or buttocks numerous disseminated and defined, pinhead- to hazel-nut-sized, spherical or oval

FIG. 103.



Neuroma of the skin; external appearance. (DUHRING.)

nodules or tubercles. They were either painful, or painless at the outset and painful later. In Rump's case, which was a sample of the

¹For a review of the subject, with full bibliography, see Krzysztalowicz, Monatshefte, 1903, xxxvi., p. 421.

²"Case of Painful Neuroma of the Skin," Amer. Jour. Med. Sci., 1873, lxvi., p. 413; also supplement to the same, with cuts, *ibid.*, 1881, lxxxii., p. 435.

³Arch. f. path. Anat. u. Phys., 1880, lxxx., p. 177.

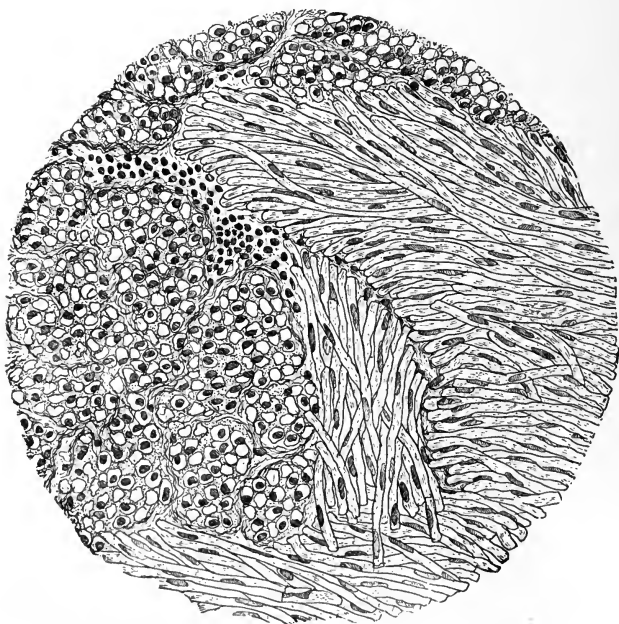
⁴Centralbl. f. Chir., 1874.

false neuroma of Virchow (fibroid tumor of the nerve), there was no pain throughout the course of the disease.

The nodules were not arranged along the tracts of nerves; were immovable, dense, and elastic; were fixed in the corium and extended below it. They were purplish or pinkish in color; and the skin between them was unaltered, or like that enveloping the lesions, dry, uneven, and desquamative. The tubercles were both tender and painful, the pain being excruciating, paroxysmal, usually lasting in Duhring's patient for an hour, and radiating. It was aggravated by temperature-changes, mental emotion, and movement.

Pathology.—These tumors are composed of a mixture of fine connective tissue with medullated and non-medullated nerve-fibres; and should properly be called neuro-fibromata. Sections of the growth in Duhring's case showed anatomically a connective-tissue stroma, interwoven with fibres for the most part lying parallel with one another, each fibre composed of a finely granular central substance surrounded by a sheath containing numerous, elongated, oval, somewhat granular nuclei. There were also yellow elastic tissue, blood-vessels with thickened and nucleated walls, and about the latter lymphoid, cell-like bodies. There was entire absence of unstriated muscular and fibrillar

FIG. 104.



Microscopic structure of neuroma. (DUHRING.)

connective tissue. The specimen represented the true amyelinic neuromata of Virchow. In Kosinski's case non-medullated nerve-fibres and connective tissue were also discovered. In both cases exsection

of a portion of nerve (brachial plexus, of the one; and small sciatic, of the other) was followed by considerable diminution of pain and almost entire disappearance of the growths. In Rump's case, which, as stated above, represented the fibromated and so-called fibro-nucleated tumors of Virchow, the nodules were strung upon the same nerve, "like beads upon a rosary," and were similarly displayed upon its branches. Spinal, cerebral, and sympathetic fibres were all involved.

Duhring, in commenting upon these rare cases, calls attention to the distinction between purely cutaneous lesions and the generally solitary, movable, and "painful subcutaneous tubercle."

Knauss¹ reports a case in a girl of eleven years. There were over sixty tumors varying in size from a cherry to a hen's egg. They were situated beneath the skin, were firm and elastic, and never painful. Histological examination showed them to be composed of medullated and non-medullated nerve-fibres, and numerous ganglionic nerve-cells.

MYOMA.

(Gr., *μύων*, muscle.)

Cutaneous myomata are divided by Besnier² into two classes: simple myoma, or liomyoma; and dartoic myoma.

Dartoic Myoma is much more common than is the other form, and is of chief interest to the surgeon. It is usually single, though occasionally multiple, and occurs most frequently on the mammae, the labia majora, the penis, and the scrotum. The tumor develops slowly, finally attaining a size varying from that of a small nut to that of an orange, and may be sessile or pedunculated. In most cases reported pain has been slight or absent, though it was marked in a case reported by Virchow. Under the influence of cold and local irritation the tumor usually contracts or may show a slow vermicular motion. Some of these tumors are composed almost entirely of non-striped muscle-fibres, others are mixed with other tissues to form a *Fibromyoma*, an *Angiomyoma* (*Myoma Telangiectodes*), or a *Lymphangiomyoma*.

Simple Myoma is rare.³ Its lesions are usually multiple and occur most frequently on the upper extremities, affecting chiefly the extensor surfaces; but they may occur on other parts of the body. They begin as minute round or oval macules or papules which develop slowly to the size of a small pea or bean, occasionally becoming larger. At first readily effaced with the finger, later they become

¹ Virchow's Archiv, 1898, cliii., p. 29.

² Annales, 1880, s. ii., i., p. 25; and Besnier-Doyon translation of Kaposi, vol. ii., p. 346, with reference to all reported cases.

³ For a résumé of cases see Crocker, B. J. D., 1897, ix., pp. 9 and 47; Roberts, ibid., 1900, xii., p. 115; Morris, ibid., 1901, xiii., p. 8 (a case shown before the London Dermatological Society); Marschalko, Monatshefte, 1900, xxx., p. 313 (with survey of most of the previously published cases); and Sobotka, Archiv, 1908, lxxxix., p. 352.

firm and elastic to the touch, are usually limited to one or two regions of the body, where they appear in patches without definite arrangement or grouping, and are pinkish, reddish, or of the color of the normal skin. In the beginning the growths are usually insensitive, but in most cases after slow evolution become painful on pressure and in some instances they are the seat of paroxysms of severe pain which occur spontaneously and at irregular intervals. Nearly all the cases reported have been in elderly people and in men. Some of the tumors may undergo involution, but usually they tend to increase in size and in number. Histological examination shows that they are limited to the derma proper, and are composed chiefly of unstriped muscle-fibre mixed with some elastic tissue, with a few vessels and nerves, and are frequently developed about the hair-follicle. They are probably derived from the erector pili muscles.

In a case under observation multiple pinhead- to large bean-sized congenital tumors were situated near the sterno-cleido-mastoid muscle of a girl nineteen years old. These were exquisitely sensitive to pressure, were capable of slight vermicular motion when irritated, and examination of the largest, after removal, disclosed smooth muscular fibres, and, in small proportion, terminal filaments of cutaneous nerves.

Diagnosis.—The diagnosis in well-marked cases is not difficult, but in some instances the recognition of the disease must depend upon a microscopical examination. Myomata have been mistaken for xanthoma tuberosum, for keloid, for lymphangioma tuberosum multiplex, and for neuro-fibroma. The last-named tumors are painful from the beginning, and usually develop in the course of a nerve.

Treatment.—The only successful treatment is by excision.

OSTEOMA CUTIS.¹

(OSTEOSIS CUTIS.)

Bony deposits in the skin and subcutaneous tissue may occur secondarily in certain diseases such as syphilis, and also as the result of trauma, examples of which may be seen in hod-carriers when bony new-growths are found under the skin of the shoulder where the weight of the hod falls. Such lesions occurring spontaneously in the skin are rare.

There is now on record a series of five cases and in each the true nature of the affection was not discovered until a microscopic study was made. These new-growths may be single and localized or multiple with more or less generalized distribution. As to origin some of the cases point strongly to their being due to misplaced embryonal

¹ Literature: Coleman, Warren, Osteosis of the Skin of the Foot, J. C. D., 1894, 185-194; Salzer, Osteoma of the Skin, Langenbeck's Archiv, xxxiii., No. 1; Pusey, The Principles and Practice of Dermatology, p. 847; Taylor, S., and MacKenna, R. W., Liverpool, Osteoma Cutis, J. C. D., 1908, xxvi., 449; Heidingsfeld, Osteoma Cutis, Archiv, 1908, xxi., p. 337.

cells, while others, especially those following diseases or produced by trauma, etc., may be examples of metaplasia.

Coleman records the case of a patient six years of age who had a plaque of cartilaginous hardness studded with tubercular nodosities occupying about one-third of the external plantar surface of the left foot. The lesion at that time had existed for two and a half years. Upon microscopic examination the growth was demonstrated to be osseous. It is interesting to note that this growth recurred after surgical removal.

Salzer reported the case of a patient having a nodule in the scalp which in the course of four or five years attained the size of a small coin. This lesion was freely movable and was excised on account of loss of hair in the area. The microscopic study of the case demonstrated its true nature.

Pusey records a case noted by F. G. Harris in which bone formation was found in a scar following a laparotomy wound.

Under the title, *Osteoma cutis*, Taylor and MacKenna described this unusual condition: The patient, a female child aged fifteen months, had several bony deposits situated in the skin of the limbs, scalp, and trunk. The largest occurred on the thigh and measured about one by three quarters of an inch. The overlying skin was purplish in color and had several millet-seed-sized pearly spots on its surface. On palpation the plaque was well defined, hard, resilient, and elastic. When bent, it would resume its former shape after the pressure was removed. Many similar but smaller plaques were distributed about the cutaneous surface. Microscopic examination demonstrated the osseous nature of the deposits.

Heidingsfeld reported finding osseous formation in a pigmented *nævus* occurring on the chin of a male patient aged twenty-one years. In this study numerous bony particles were found and the author ascribes the condition to misplaced embryonal rests.

ANGIOMA.

(Gr., ἀγγειον, vessel.)

Angiomata are divided into those composed of blood-vessels and those formed of lymphatic vessels. The former are much more frequent and variable in character.

Symptoms.—Blood-vascular new-growths occur in three forms: *nævus vasculosus*, *telangiectasis*, and *angioma cavernosum*.

Nævus Vasculosus (*Nævus Flammeus*, *Nævus Sanguineus*. Ger., *Gefässmal*).—"Port-wine" spots are those vascular anomalies of the skin which are either visible at birth or become developed in a brief period thereafter. They are usually observed as reddish maculations of various sizes and shapes. They have a distinct outline and are made up of fine blood-vessels which disappear momentarily on pressure. The most common location is the back of the neck but they

may occur on any part of the body and on the mucous membrane of the lips. In some cases they are of a deep violet to port-wine color, occasionally they are somewhat elevated, and the surface may be studded with nodules which are cavernous angiomes. Thrombosis followed by gangrene may occur in nævi of newborn infants and result in spontaneous cure. They may exhibit peripheral extension and central atrophy. Whitefield mentions a case in which the entire cutaneous surface of the abdomen was in an atrophic state surrounded by a zone of telangiectases. The most extensive case on record is that of Heller.¹ Almost one half of the body was involved. Where extensive this anomaly is usually associated with giant-growth,² or hypertrophy of the bone and soft parts of an extremity. Osler has reported a family form of recurring epistaxis associated with multiple telangiectasis of the skin and mucous membranes. Epithelioma may develop on vascular nevi.

Generalized Telangiectasis.—Brocq³ and several others have reported cases of this rare affection. It consists of macular areas, sometimes slightly scaly, which are usually scattered and sometimes large in extent. The plaques are bluish-red in color resembling the dorsal surface of a cadaver; hence this condition has been called "cadaver skin." The affection develops at puberty or in adult life. It may follow castration in women, scarlet fever, nephritic degeneration, and may occur without assignable cause. Hyde⁴ has reported cases of telangiectasis in exophthalmic goitre, which had been mistaken for mycosis fungoides and lupus. Facial telangiectasis also occurs in rosacea.

Only when carefully scrutinized will it be recognized that the affected area consists of a fine network of capillary vessels and is not an erythema as it appears to be at first view.

Nævus Araneus (*Spider Cancer*).—This lesion consists of an aneurismal dilatation of a papillary loop, producing a pinhead-sized red papule which does not always disappear on pressure and from which fine blood vessels radiate like the spokes of a wheel.

Angioma Cavernosum (*Tumor Cavernosus*).—Cavernous angioma is distinguished from the angiomatous lesions described above by the peculiarities of its formation. It consists of a dense framework of new-formed connective tissue, inclosing loculi or chambers of varying capacity, which contain blood, and communicate, not only with each other, but with the larger vessels in the vicinity. Whether these blood-spaces originate in the fibrous felt-work of the derma which later establishes a vascular connection, or in the vessels themselves, or whether they are constituted by a mechanical dilatation of such vessels in consequence of a new-formed connective tissue in the adventitia, has not been determined. According to Virchow, the lesions arise generally from coalescence and dilatation of vessels. Other

¹ Berliner klin. Wochenschrift, 1898, p. 1003.

² Annales, 1893, s. iii., iv., p. 233.

³ Annales, 1897, s. iii., viii., p. 41.

⁴ B. J. D., 1908, xx., p. 33.

causes are explained by the earlier formation of a contracted cicatricial tissue by which vascular distortion occurs. (Rindfleisch.)

Cavernous angiomata are said to be rarely congenital, developing soon after birth, and to be both superficial, deep, circumscribed, and diffuse. Sometimes they originate from a *nævus* or superficial telangiectasis. Often when fully formed they are distinctly encapsulated. The diagnosis is between cysts, fibromata, lipomata, and sarcomata. The rarity of this affection in dermatological practice may be explained by the surgical features of many cases. In five years no instance of angioma cavernosum was reported in the statistical tables of the American Dermatological Association. Post¹ reports a unique case in which the tumors were numerous, large, and firm, and recurred after removal.

Etiology and Pathology.—The causes of the several forms of angioma named above are obscure. The symptomatic telangiectases are undoubtedly to be explained by obstruction to the circulation occasioned by the tumor or other lesion to which they are accessory. The foundation for the vulgar belief that maternal impressions are responsible for the so-called "mother's marks" is very slight. The reputed resemblance of the latter to various flowers and fruits generally requires for its recognition a stretch of the imagination.

Anatomically, these lesions are recognized as due to dilatation and new formation of venous and arterial capillaries in the superior portions of the derma, the vessels of the newly formed plexus freely communicating with each other. Generally there is a simultaneous new formation of connective tissue constituting the framework of the growth, which varies considerably in the different forms of the disease. Lobules constituted of coils of capillary vessels are often separated by it into distinct masses. According to Heitzmann, the large spaces of angioma cavernosum imitate the structure of the corpora cavernosa of the penis, and are filled with venous blood, being separated from each other by a scanty fibrous connective tissue.

Billroth states that the new formation has its origin in the vascular network surrounding in basket-like forms the fat-lobules, follicles, and glands of the skin. Embryonal, vascular growths spring from these, and as they multiply and develop are enforced by proliferation of fibrous, connective, and muscular tissue. The color depends largely upon the preponderance of arterial or of venous capillaries in the new formation.

Diagnosis.—The ordinary lesions of angioma are readily recognized by their color, size, shape, and obvious vascular constituents. Anderson calls attention to the importance of differentiating encephalocele due to the failure of ossification of the ethmoid and frontal bones at the root of the nose. Operations upon such tumors supposed to be angiomatous in character have resulted fatally. Lobulation, great distention (when a child is crying), a superficial rather

¹ J. C. D., 1903, xxi., p. 498.

than deep and complete vascularization of the smooth and glossy skin of the tumor, and a double pulsation, all point to frontal encephalocele.

Treatment.—Pusey¹ has recently recommended the use of carbon dioxide snow in the treatment of vascular and pigmentary nevi. This method of treatment is capable of doing harm if not intelligently employed.

Liquid carbon dioxide is obtainable wherever soda fountain supplies are sold. It is furnished in cylinders. When in use the cylinder is placed in a rack inclined so that the opening is at the lower end. As the key is turned the carbon dioxide snow is collected in a chamois skin held over the mouth of the cylinder. It is moulded in the chamois skin into the desired form and cut with a knife into a block one centimeter square in size.

Applied to the surface of a nævus with slight pressure while held in forceps it freezes the tissue in from five to ten seconds, and thawing occurs in twice that length of time, producing a stinging sensation. The duration is the most important factor of the treatment. If the freezing is not maintained for a sufficient length of time no therapeutic effect will be produced; if too long continued bullæ form on the surface, an eschar is produced which when exfoliated leaves a telangiectatic scar more disfiguring than the nævus.

Nævus araneus and small nævi are best treated by electrolysis. One or a set of several fine cambric needles, with their points at the same plane, are connected with the negative pole of an ordinary zinc and carbon battery of ten or twelve cells. The points of the needles are passed quickly into the tissues and there held for a period of between ten and thirty seconds, according to the effect produced after completion of the circuit, with a current of from one to two milliamperes. The new-growth is thus blanched in the vicinity of the needles, this effect disappearing in the course of a few moments.

Coombs modified the above method, by passing fine silver wires through nævus-growths, and connecting the extremities with a Bunsen battery. When the wires are heated the circuit is broken, and the ends of the wires are disconnected from the battery and united to each other, being left *in situ* and covered with lint and plaster. The current can then be passed repeatedly without reinsertion of the wires, and the latter need be withdrawn only when the cure is complete.

Phototherapy has proved effective in a small number of cases of vascular nævi. The method is preferable to electrolysis when a considerable area is involved, or when the individual vessels supplying or composing the nævus are not distinctly visible. We have secured great improvement with the treatment in two extensive cases of this type.

The method of Sherwell² is by multiple puncture with a set of fine needles in a holder similar to that described above. These are

¹ J. A. M. A., xlix., p. 1354.

² Archiv, 1879, v., p. 354.

dipped in a 25 to 50 per cent. solution of chromic acid, and then made to penetrate the part to be attacked. The bleeding is readily arrested by pressure, and then the patch is covered with several layers of flexile collodion. This procedure is of value in circumscribed patches of superficial character and relatively limited area. By it one can succeed in removing port-wine marks with the result of producing a somewhat irregular cicatriform tissue much less disfiguring than the original blemish.

Other methods employed are the ligature when practicable; puncture with incandescent needles; topical application of caustics other than those named above, such as potassium hydroxide, nitric and carbolic acids, and corrosive sublimate; and total excision, the latter being practicable in relatively small growths. Larger growths also can be removed and the surface covered with skin-grafts. The galvano-cautery and the thermo-cautery are both valuable in the destruction of capillaries. The old method of multiple vaccination about and upon the involved area is sometimes followed by good results, and whether in consequence of the retraction of tissue under the influence of the inflammation excited, or of the destructive results of the suppuration induced, or of an indefinite caustic effect, is not clear.

These results may be partly imitated by the production of superficial pustulation and suppuration through the medium of tartar emetic and croton-oil, methods which should be considered clumsy in the light of recent successes obtained by more manageable expedients.

Injections with carbolic acid and ferric chloride should not be employed as there is danger of fatal embolism.

The treatment of angioma cavernosum requires surgical interference.

Prognosis.—The prognosis in any case of angioma rests upon the method of treatment adopted for its removal. In the larger number of cases the lesions, having attained a maximum development, persist without further pathological change, constituting a deformity rather than a disease. Physiological alterations in the color of such lesions occur under the influence of changes in the circulation.

ANGIOMA SERPIGINOSUM.

(INFECTIVE ANGIOMA, NÆVUS LUPUS.)

This disease has been described and figured by Hutchinson,¹ Jamieson, Lassar, Joy, White, and others. It is one of the rarer affections of the integument.

Symptoms.—The elements of each group of lesions are bright-reddish puncta, resembling grains of Cayenne-pepper, arranged in oval or circular rings which are definitely outlined and are a centimetre or more in diameter. The "infective satellites" are outlying points or patches where the disease is spreading. This extension is

¹ Arch. of Surgery, 1889, i., p. 289, Plate IX.

usually at the outer border of one of the annular groups of lesions. The color varies from a light- to a deep-reddish hue or purple; tints which are due to the vascularity of individual lesions. The color can at times be made to disappear on pressure.

The parts chiefly affected are the shoulder, the leg, the elbow, the ear, the arm, the hand, and the chest. The disease may occur in infancy or adult years. Its evolution is slow, and usually unproductive of subjective sensations. Occasionally the tufts of dilated capillaries which constitute the reddish points are not grouped in a circinate or other special arrangement, but simply irregularly distributed over the affected surface.

Etiology.—The cause of the disease is unknown. In a case under our observation in a female infant the lesions developed as a sequence of a congenital nævus of the vulva. Hutchinson has made a similar observation. The affection has been noted more often among male patients. One case is supposed to have originated in violent muscular exercise.

Pathology.—The disease, being at first but obscurely understood, was until recently supposed to be one of the several expressions of lupus and was for that reason assigned one of the names given above. Examination of tissue removed from a patient whose case was fully reported by White,¹ which was in all points typical, reported upon also by Darier, Councilman, and Bowen, indicates that the disease is an angiosarcoma. Darier describes it as *Sarcome Angioplastique Réticulé*. The corium was found well filled with small-cell infiltrations and these cells had an epithelioid nucleus. There were abundant proliferation of the endothelium, peri-vascular cellular infiltration, and a new formation of vessels.

Diagnosis.—The disease is to be recognized by its vascular puncta and by their special tendency to grouping and extension through a serpiginous process never seen in simple telangiectases, nor in common forms of nævus vascularis.

Treatment.—The treatment is by surgical ablation or destructive cauterization.

TELANGIECTATIC GRANULOMA.

Kuettner, and also Reitman² have described a peculiar form of granuloma somewhat resembling angioma serpiginosum. A simple granuloma is a proliferation of connective tissue developing from the surface of a wound. This disease is a proliferation of endothelial tissue. Clinically it consists of a pea-sized growth of endothelial tissue which bleeds freely and which is surrounded by pin-head-sized puncta of bright red color.

LYMPHANGIOMA.

In the present state of knowledge on this subject it is not always possible to draw sharp dividing-lines between lymphatic new-growths

¹ J. C. D., 1894, xii., p. 505.

² Archiv, 19, xci., p. 185.

on the one side and simple lymphangiectasis on the other. It is probable that the two processes often are associated.¹

Lymphangiectasis, uncomplicated by growth of new vessels, may occur in the superficial or deep lymphatics. When superficial, pin-head- to pea-sized, isolated or grouped vesicles form which have the color of the normal skin, which disappear temporarily under pressure, and which do not break easily, but on rupture give exit to a continuous or intermittent flow of lymphatic fluid. Elliott² describes a case of this kind in which the vesicles bordered old scar-tissue and were seemingly identical in character with the lesions of lymphangioma circumscriptum, but histological examination showed them to be formed by simple dilatation of the lymphatic capillaries, due probably to mechanical obstruction.

Lymphangiectasis of the deeper vessels often produces no change visible on the skin, and can then only be recognized by palpation, or it may be displayed in raised, irregular cords, or in chains of nodules. Following injuries or inflammation it may be acute, but usually it is chronic, and occurs most frequently on the lower extremities and in parts in which the return current of the circulation is in some way impeded. The skin may become the seat of soft nodules which may rupture and form lymphatic fistules; but more frequently the greatest changes occur in the deeper structures, resulting in elephantiasis, in phlegmon, or in lesions of periosteum and bone, the skin of the affected region being œdematous, infiltrated, ulcerating, or cicatricial.

Simple Lymphangioma may occur upon any part of the body in the form of circumscribed, elastic tumors made up of enlarged lymphatics which are the result partly of dilatation of previously existing vessels and partly of new-formations. The skin over such tumors may be unchanged or it may be reddened and thickened. In more extensive cases there is hypertrophy of the surrounding tissues as in deep-seated lymphangiectasis. Many of the diffuse forms of lymphangioma constitute firm or lax tumors of such size as to be termed *Elephantiasis Lymphangiectatica* or *Pachydermia Lymphangiectatica*. These tumors often contain large lymph-filled sacs or lacunæ, enveloped in hypertrophied muscular and connective tissue, and an œdematous integument. Some of the elephantiasic deformities of this character are fully as enormous as the extreme distortions of elephantiasis proper. Upon the tongue the condition is called *Macro glossia*, and upon the lips *Macrochilia*.

Lymphadenectasia is a name given by Virchow to tumors usually in the axillary or inguinal regions, where the lymphatic vessels in the lymphatic glands dilate or multiply so as to form large tumors. The lymph-scrotum due to the presence of the *filaria sanguinis hominis* is described elsewhere.

Simple lymphangiomata may be congenital.³ Their cause is un-

¹ For review of literature of the subject, consult Francis, B. J. D., 1893, v., p. 65; and Roberts, *ibid.*, 1897, ix., p. 309.

² J. C. D., 1894, xii., p. 137.

³ Volmer, *Archiv*, 1903, lxx., p. 343, reports a rare case, with illustrations, histology, and bibliography.

known. It is supposed that they are produced by toxic or other irritating influences. They are often the seat of a recurrent, circumscribed inflammation of erysipelatous type. Anatomically the lesions are found to consist of greatly developed lymphatic vessels and spaces, lined with epithelium and enveloped in small-celled connective tissue-stroma. The treatment of the larger lesions only is surgical.

Cystic Lymphangioma belongs to the domain of surgery. It occurs in the form of multilocular cysts, usually congenital in origin and most frequently situated in the neck.

Lymphangioma Circumscriptum.

(LYMPHANGIOMA CAVERNOSUM, LYMPHANGIECTODES, LYMPHANGIOMA CAPILLARE VARICOSUM, LUPUS LYMPHATICUS. *Fr.*, ANGIOME CYSTIQUE.)

This is practically the only form of lymphangioma entitled to special consideration by the dermatologist. It is a rare form of skin-disease and is illustrated well in the case reported by Morris.¹ Cases have been reported by Török,² White, Francis,³ Hartzell, Elliot, Gilchrist, Brocq and Bernard,⁴ Schnabel,⁵ and others.

Symptoms.—The characteristic lesions are small, deep-seated vesicles generally described as resembling frog's spawn. They are usually closely crowded in irregularly shaped groups from eight to twenty millimetres in diameter with normal skin between. These groups have no regular arrangement or distribution. There are sometimes a few scattered vesicles about or between the borders of the groups which may coalesce to form new patches. There are usually several of these groups, but they are confined, as a rule, to one small region of the body. The most common sites, according to Francis, who has collated reports of twenty-eight cases, are on the upper parts of the extremities and the mucous membrane of the mouth, pharynx, and tongue. In a large majority of the cases reported the lesions occurred on the left side of the body. The vesicles are deep-seated with thick walls, and vary in size from that of a pinhead to that of a small pea. The newer and scattered vesicles may be colorless or have a yellowish or pinkish tinge (pachydermatous lymphangioma). The skin over the older lesions may hypertrophy and produce growths that are easily mistaken for warts, and may even result in decided warty projections. Other lesions may be more or less covered with telangiectases and vascular dots or tufts which may be present to such an extent as to obscure the primary vesicle-formation. When punctured the lesions give exit to clear, colorless fluid, in greater quantity than

¹ Internat. Atlas, 1889, No. 1.

² Monatshefte, 1892, xiv., p. 169, with critical review of previously published cases.

³ B. J. D., 1893, v., with review of literature.

⁴ Annales, 1898, s. iii., ix., p. 305 (full discussion of the subject, with review of literature).

⁵ Archiv, 1901, lvi., p. 177, with histology and references.

the vesicles contain which at times may be tinged with blood, the result of hemorrhage.

In some cases the lesions and skin about them become the seat of a recurrent inflammation of erysipelatos type,¹ such as not infrequently complicates other forms of lymphangioma. Probably as a result of these attacks of inflammation there are often infiltration, thickening, and even true hypertrophy of the deeper layers of the skin, forming a sort of local elephantiasis.

The disease in most cases reported began in early childhood and developed very slowly, often remaining stationary for years. In but one case has spontaneous involution been reported.

Etiology.—As the disease usually makes its appearance in infancy or early childhood, it is probable that its origin is due to some congenital defect. It has appeared a number of times in connection with nævi. It has followed surgical operations, bordering the scars pro-

FIG. 105.



Lymphangiectodes (McEwen).

duced by the operator; it is possible that such cases are simple lymphangiectases of the capillary vessels due to blocking of the larger channels by the scar-tissue.

¹*Cf.* White's report, J. C. D., 1894, xii., p. 47; also Bowen's article in *Twentieth Century Practice*, vol. v., p. 687.

Pathology.—The vesicles, or cysts, are found on section to be situated in the upper part of the corium. These cysts are shown to have an endothelial lining and undoubtedly are dilated or newly formed lymph-capillaries. Immediately about the cysts and dilated lymphatics in an early uncomplicated lesion Bowen found considerable infiltration of round cells, but no other changes in the corium, while the epidermis was slightly thinned. In older lesions there is hypertrophy of the epidermal layers, and sometimes of the deeper parts of the corium. In other cases there are more or less dilatation and apparent new-growth of the blood-capillaries. This change in the blood-vessels may be slight or so marked as to form the chief feature of the disease both clinically and pathologically. In consequence, confusing reports have been made by different observers regarding the structure and origin of these growths, many of which seem entitled to the name of hemato-lymphangioma.

Treatment.—The treatment is surgical. The growth may be removed by excision or with the cautery. Electrolysis has been of service in some cases and should be given trial. In several instances the lesions have recurred after complete removal.

MOLLUSCUM EPITHELIALE.¹

(Lat., *molluscus*, soft.)

(MOLLUSCUM VERRUCOSUM, MOLLUSCUM SEBACEUM, EPITHELIOMA CONTAGIOSUM, MOLLUSCUM CONTAGIOSUM (Bateman), ACNÉ VARIOLIFORME (Bazin).)

Molluscum epitheliale, a disease first recognized in 1817 by Bateman under the title Molluscum Contagiosum, presents a more extensive literature than any of the benign tumors because of the difficulty encountered in establishing the fact that it is not a disease of the sebaceous glands.

Symptoms.—Typical epithelial mollusca are firm, roundish bodies averaging in size the dimensions of a pea, and in color varying from a waxy whitish hue, nearly that of the integument, to the dark-red tint of injected masses. They are either imbedded in the skin or project from it as smooth, firm, semiglobular, sessile or pedunculated tubercles. Usually a dark-colored aperture can be detected at the apex or side of the lesion, from which on pressure, milky and curd-like, semifluid contents can be made to exude. Occasionally, inspissated or even horn-like masses project from these orifices, as though forced out by a *vis-a-tergo*. The disease is rare, and the lesions are usually single and isolated, though hundreds may appear upon the person of one individual. They consist of semifluid collections derived from the hair follicle or from percolation between the papillæ of the derma. They may be removed by surgical procedures; or be shed

¹ For a complete review of the subject with bibliography and additional research in the pathology and bacteriology of the disease, see White and Robey, Jour. of Med. Resch., 1902, vii., p. 255.

spontaneously; or inflame, and result in circumscribed abscess; or terminate by ulceration. More often they are insidious and slow of development, and may persist for years without producing annoyance or subjective sensation. They occur on the face, the side of the neck, and the nucha; on the penis and scrotum of men, and the breasts and labia of women; on the trunk; on the flexor surfaces of the extremities, and the dorsal surfaces of the hands and feet. They are most common in children. In consequence of the depression of the centre of the little tumors (which Hutchinson has happily likened to small pearl buttons) they may suggest the lesions of variola, hence they were described by Bazin under the term Varioliform Acne. This title, however, is by most writers employed to designate a totally different affection, to which a chapter is devoted in this work.

Hebra, Virchow, and Nicolaysen have reported mollusca as large as an orange or a small cocoanut. Microscopical examination of these gigantic lesions demonstrated their identity with the smaller tumors. Similar bodies of less size have been found interspersed among epitheliomata.

Etiology.—In England where the disease was first recognized, it is more frequent than on the continent of Europe. The contagiousness of molluscum is experimentally established, though the lesions are feeble in propagation by contact. Retzius, Vidal, Peterson, and Wigglesworth succeeded in producing the disease by inoculation of the contents of molluscous tumors. The period of incubation after inoculation is from two to three months. The proofs of contagion apart from experimental inoculation rest chiefly upon the circumstance of lesions being simultaneously or successively observed on the breast of a mother and the face of her nursing, and upon the successive development of mollusca in several members of one family. Ehrmann¹ believes that the disease may be conveyed from one person to another by the pediculus pubis. An interesting relation would seem to subsist between mollusca and verrucae, or ordinary warts, which are supposed to be feebly contagious.

Stelwagon² has accumulated and classified reports of cases and of inoculations which seem to leave little doubt as to the parasitic nature of the disease, though no definite organism has yet been demonstrated in, or cultivated from, the growths. Eczema, sweating (Turkish baths), pruritus, and maceration of the skin predispose to the occurrence of mollusca; but there are insufficient grounds for assuming that in adults they are associated with venereal disease. They are seen not rarely in large numbers upon the scrotum of youths who have never exercised the sexual function.

Pathology.—Sections through the centre of a lesion of molluscum epitheliale show that it is formed by a number of diverging flask-shaped lobules, the small end of each lobule opening into a common central cavity. The lobules are separated from each other by a thin

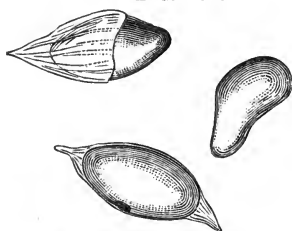
¹ Ehrmann, Zweiter Internat. Dermat. Congress, Wein, 1892, p. 284.

² J. C. D., 1895, xiii., p. 50.

fibrous partition, which may occasionally be demonstrated to be the remains of a papilla. The entire mass or group of lobules is surrounded, except at the surface-opening, by a fibrous capsule, thus giving the entire structure an appearance very similar to that of a sebaceous gland. The belief, formerly held, that the process originated in the sebaceous glands, is erroneous. Minute examination fails to find any trace of a sebaceous gland in these formations. The process begins as a proliferation of epithelial cells in the lower layers of the rete. The growth is confined to the rete, from which the flask-shaped processes are pushed out, causing a flattening and more or less complete disappearance of the underlying papillæ.

Each lobule is lined with a layer of palisade-cells continuous with the same layer in the healthy rete adjoining the growth, and is filled with round and cuboidal nucleated epithelium undergoing peculiar changes. The first two or three rows of cells are usually normal but above them the changes become gradually more marked. The

Fig. 106.



Molluscous corpuscles.
(After KAPOSI.)

exact nature, sequence, and significance of these changes are in dispute, but it would seem to be fairly well established that the outer part of the cell shows early in the process abundant granules of keratohyalin, and soon undergoes a cornification forming a clear ring or "capsule" for the cell. Within, the changes have been considered similar to those seen in amyloid or colloid degeneration, but C. J. White¹ found that in over nine hundred sections the staining reaction of the molluscum bodies was identical

with that of normal keratin. Authors describe a granular condition surrounding the nucleus, which is usually at one end of the cell, while the remainder of the cell-protoplasm shows vacuoles or groups of small, irregularly shaped, hyaline bodies, uniting to form an oval mass which gradually encroaches upon and distends the cell. This oval homogeneous corpuscle surrounded by a horny capsule forms the so-called "molluscum body." These bodies accumulate at the mouths of the lobules and in the small common cavity in which the lobules all open, and may be pressed out upon the surface of the skin in a yellowish or whitish semifluid or waxy mass.

The more minute changes in the cells and the methods of recognizing them are given in detail by Unna and others. The theory that the disease is caused by psorosperms has been abandoned.

Diagnosis.—Mollusca resemble the lesions of variola more than any other cutaneous phenomena. They are, however, readily distinguished from the latter by their chronicity, their semifluid contents, the absence of febrile symptoms, and the career of variolous pustules. From warts they are also differentiated by their contents, hemispherical shape, and the dark punctum almost invariably present on one part or another of the lesion.

¹ Loc. cit.

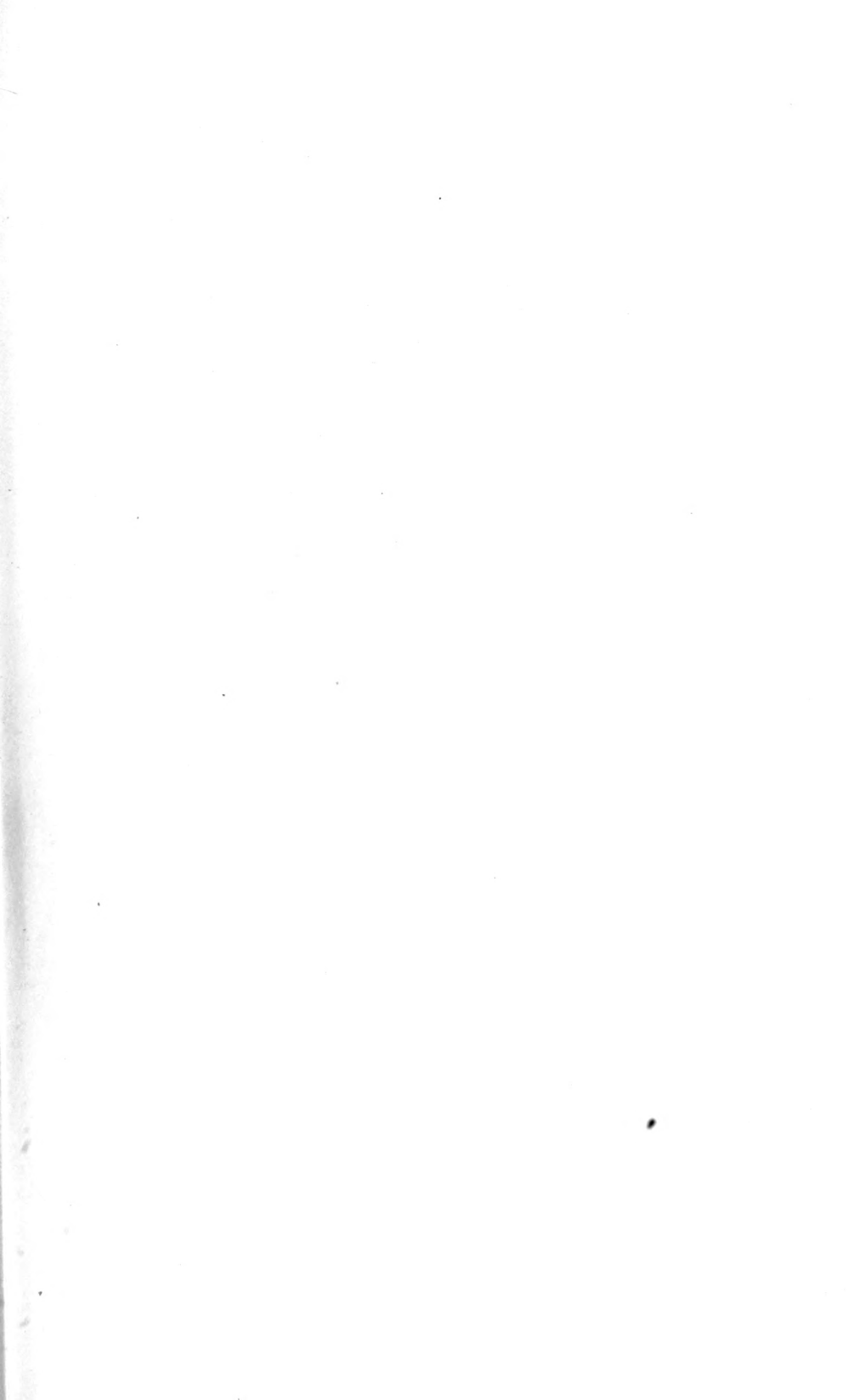


PLATE XXVII

FIG. 1

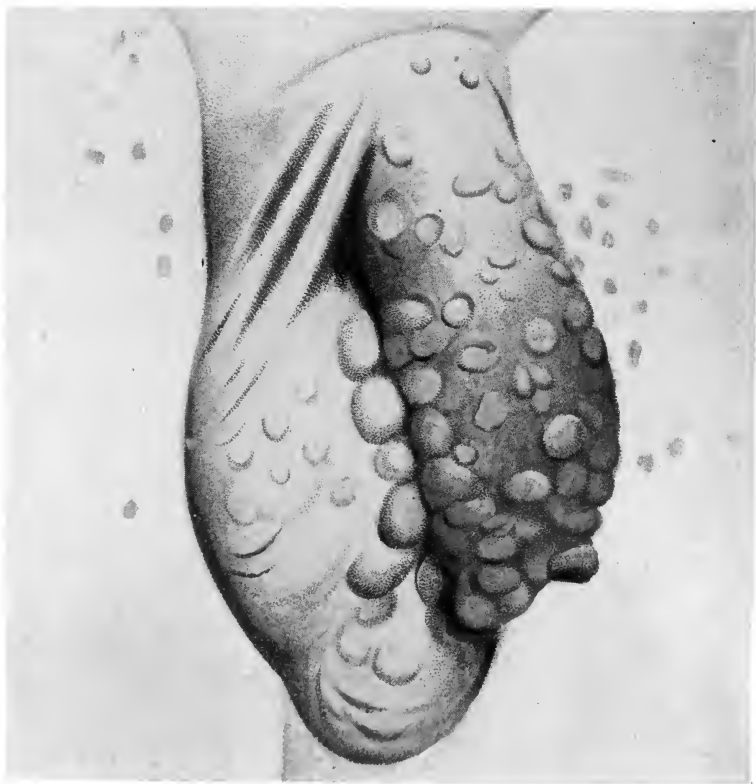


FIG. 2

Fig. 1. Xanthoma of the Hands, Elbows, and Knees.

Fig. 2. Xanthoma Tuberosum of Back and Shoulder.

Molluscum epitheliale in no way suggests molluscum fibrosum, with which it has been confounded only in consequence of the similarity in name. The tumors of molluscum fibrosum are solid new-growths, usually occurring in great numbers upon the trunk of individuals of adult years. They may attain enormous dimensions, the masses reaching several pounds in weight; and though in cases they degenerate by ulceration, they never enclose the curdy contents of molluscum epitheliale.

Papillary warts are to be distinguished from mollusca, though without question lesions are occasionally seen of a type intermediate between the two forms. Warts are to be recognized by their general papilliform character, and by their evident relation to the papillary layer of the corium overlaid by a thickened stratum corneum.

Physicians are occasionally consulted by patients who have discovered mollusca upon the genitals, and who suppose these lesions to be of venereal origin. An error in this respect can scarcely be committed by the expert. Neither the solid papule of the initial lesion of syphilis when observed on the skin of the penis, nor the pustule and resulting ulcer of the chancre, exhibit the waxy look of genital mollusca with their depressed puncta. In such cases the inguinal glands should always be examined carefully, remembering, however, that a forcibly squeezed and cauterized molluscum may be accompanied by sympathetic adenopathy.

Treatment.—When the tumors are few in number they may be removed by pressing out the contents through the central orifice. In some instances this slight operation is facilitated and rendered less painful by first making a linear incision over the growth. In children and others sensitive to the pain, the surface may be rendered anæsthetic by the use of ice or ethyl-chloride spray. Bleeding is arrested easily with a pledget of lint. Occasionally after removal of the contents the point of a crayon of silver nitrate may be introduced either to check hemorrhage or insure destruction of the cyst, or carbolic acid may be introduced on the end of a pointed stick.

When the lesions are numerous, they may be made to exfoliate and disappear by the local application of green soap. Stelwagon recommends in such cases the use of an ointment containing 20–40 grains (1.3–2.6) of white precipitate or of sulphur to the ounce (30.), the ointment being rubbed vigorously into the affected parts once or twice a day.

Prognosis.—The disease can always be terminated by removal of the tumors, the process to be repeated in case of recurrence.

XANTHOMA.

(Gr., *ξανθός*, yellow.)

(XANTHELASMA, VITILIGOIDEA. *Fr.*, PLAQUES JAUNÂTRES DES PAUPIÈRES.)

This affection was described by Rayer¹ under the title Plaques jaunâtres des Paupières; by Addison and Gull (1851) as Vitili-

¹ *Traité prat. des Maladies de la Peau*, Paris, 1836.

goidea; by Erasmus Wilson as *Xanthelasma*; and by W. F. Smith (1869) as *Xanthoma*, the name now generally accepted by writers.

Xanthoma is a single or multiple new-growth involving the corium and occurring as yellowish, well-defined, round or oval nodules, plaques, lines, or ribands; or as diffuse infiltrations of the skin, composed of fibrous and fatty tissue.

The disease is observed clinically in three varieties: *Xanthoma tuberosum*, *Generalized Xanthoma*, and *Xanthoma Planum*.

Symptoms.—*Xanthoma Tuberosum*.—The classical location of the disease is the eyelid (*Xanthoma Palpebrarum*), where the lesions are pin-head- to pea-sized, chrome-yellow nodules which usually become confluent, forming plaques. They occur most frequently on the upper lid at the inner canthus; they may affect the entire upper lid or the lower lid or encircle the eye. They first appear on one side, but after a time both eyelids become involved. In rare cases they develop on the cheeks, the nose, the ears, and the nucha. They are rarely productive of subjective sensation, being occasionally the seat of slight pruritus. They develop very slowly, and after attaining an average size rarely increase or diminish.

*Generalized Xanthoma*¹ is the form in which the lesions, usually first manifested in the sites of election and in their simplest development proceed to a gradual invasion of the trunk and extremities. The regions of greatest pressure, outside of the lids and cheeks, are sites of preference, as, for example, over the elbows, knees, palms, and buttocks, but the ears, neck, and upper chest may be involved. In some rare cases where the disease appears in childhood the eruption may become generalized. The genital region is usually affected in these cases. Papular and tubercular lesions may coexist with the plane lesions described above, and scarcely differ from the latter save in a greater development. The lesions are whitish or yellowish papules, plaques, and tubercles, circumscribed in contour, millet-seed- to nut-sized, at times much larger, covered with an unaltered epidermis, and determinable by palpation as having greater consistence than the flat macules. They are seen less frequently upon the lids, but occur upon the scalp, cheeks, palmar and plantar surfaces, the genital region, and about the joints of the digits.

In rare cases the tubercles may coalesce to form sessile or pedunculated, nut- to hen's-egg-sized tumors which are firmer as a rule than the smaller lesions (Cary² and Chambard³).

The conglomerate forms upon the skin constitute large plaques resembling tumors, compounded of lesions of *xanthoma tuberosum*. They are distinctly circumscribed, deeply imbedded in the corium, elevated to the extent of one-fourth of an inch above the general level of the integument, and irregularly furrowed or lobulated superficially.

¹ For bibliography, see Richter, *Monatshefte*, 1903, xxxvi., pp. 57 and 126; and Leven, *Archiv*, 1903, lxvi., p. 61.

² *Annales*, 1880, s. ii., i., p. 75.

³ *Arch. de Phys. norm. et path.*, 1879, s. ii., vi., p. 330.

PLATE XXVIII



Xanthoma Tuberosum of Hands.







Xanthoma Multiplex.



Xanthoma Multiplex.

Other cases display unusual features of this disease. In one there may be flattened bands exhibiting xanthomatous changes in both palms, stretching at right-angles to the long axis of the hand; in a second and somewhat rare form of the disease isolated xanthomatous papules may be attached somewhat regularly to the edges of the lids of both eyes, the upper and lower equally, while large, pin-head-sized, and equally isolated yellowish masses are visible below the orbits on each cheek.

Other organs of the body may be affected; nodules may appear on the conjunctiva and cornea of the eye, in the mouth on the palate; in Rhodes' case nodules developed in the trachea causing obstruction of such degree that tracheotomy became necessary and the patient wore a tracheotomy tube continuously. Nodules may also form in the bronchi, in the œsophagus, gastro-intestinal tract, on the peritoneum, pericardium, spleen, and large arteries. Some of the cases of jaundice which last for years are due to xanthoma nodules forming in the ductus choledochus.

In certain cases the disease is accompanied by a generalized coloration of the skin in a yellowish shade, which has been variously interpreted as a xanthomatous dyschromia and as a true icterus. The former is the more probable explanation of the fact, as in such cases the urine and viscera have been found normal. A woman presenting one of the extreme phases of this icteroid xanthomatous condition of the skin was shown at the International Congress of Dermatology in London in 1896.

Lieberthal exhibited a young patient before the Chicago Dermatological Society with multiple lesions of Xanthoma where the sheath of the tendo Achillis was involved.

Occasionally the tubercles exhibit a fine vascularization; and when there is a coincident jaundice the skin between isolated lesions is also tinted with the color of the xanthoma nodules. The jaundice, so-called, is rather common in the multiplex forms; and even when not readily recognized, the skin at first sight of normal tint, is seen to be somewhat deeply colored in a shade of reddish yellow. As a rule, there are scarcely distinguishable subjective sensations, patients commonly applying for relief of the resulting facial disfigurement. Occasionally burning and pricking, and rarely even painful sensations are produced.

The course of most cases is toward a maximum of development, after which the process ceases. In a few instances, usually not palpebral, complete involution has occurred spontaneously. The variations noted in the color of the plane and elevated forms of Xanthoma are from a light-yellow to a deep-brownish and even blackish hue. Cases occurring in children and infants seem to exhibit nearly the same features as those seen in adults.

XANTHOMA SOLITARIUM.—In rare instances a single lesion of xanthoma may be recognized over the body-surface (eyelids, chest, thigh, leg). In these cases the lesion usually attains the size of a large

coin and is well elevated and defined, involving the entire thickness of the skin.

Xanthoma Planum.—This is a rare form of the disease. The eruption consists of pin-head-sized and larger lesions which are chamois to orange color, located especially on the face, most frequently on the forehead, and whose chief distinguishing feature is that they are not elevated, but imbedded in the skin.

XANTHOMA ELASTICUM (*Pseudo-xanthoma Elasticum*) has been recognized by Balzer,¹ Besnier,² Doyen, and Bodin.³ In this condition large coils of elastic tissue surrounded the follicles, the fibres being swollen and degenerated. The lesions were pin-head- to pea-sized, papular, yellowish patches occurring over the flexor folds, about the umbilicus, the clavicles, and the extremities, the eyelids being unaffected. Neither xanthoma- nor fat-cells were recognized.

Etiology.—The causes of the disease are obscure. In a few cases the lesions are observed first in early childhood, though they are encountered chiefly in middle and later life after the fortieth year. Women are affected rather more often than men.

The belief is growing that xanthoma is due to embryonic and local causes. Many instances are on record in which several members of a family were affected. Török and T. C. Fox have each reported families in which members of three generations presented the disease. The mother, of the patient exhibiting multiple lesions upon the elbows and knees, whose case was selected for illustration of these pages, presented plane lesions of xanthoma near the inner canthi of the eyes. The studies of Török⁴ in this direction are instructive. The association of xanthoma with disease of the liver, rheumatism, gout, ovarian disease, migraine, syphilis, carcinoma, hydatids, and other disorders cannot be denied for certain cases, but in the majority no such association can be recognized. Multiple plane lesions of the lid in a middle-aged woman have succeeded a dermatitis of that region, induced by accidental contact with a corrosive solution of mercury.

Pathology.—The anatomy of xanthoma has been investigated specially by Chambard, Balzer, Touton,⁵ Török, and others. The process is a connective-tissue new-growth, containing cells infiltrated with fat-granules. Aside from the new-formed connective tissue and endothelial cells there are seen between the interlacing fibres the characteristic "xanthoma-bodies." These are cells varying greatly in size, having a distinct membrane, granular or fibrillated protoplasm, and large round or oval vesicular nuclei, which vary in number from one to a dozen or more.

These "xanthoma-cells" are grouped especially about and along the vessels, and form globular masses in the deeper parts of the corium, though they may extend almost to the rete. They are more or

¹ Arch. de Phys., 1884, s. iii., p. 65.

² Trans. of Kaposi, vol. ii., p. 336.

³ Annales, 1906, s. iv., vii., p. 1073.

⁴ Ibid., 1893, s. iii., iv., pp. 1109 and 1261.

⁵ Vierteljahr., 1885, xii., p. 3, with reference to previous reports.

less infiltrated with fat-granules, and correspond closely in structure to the developing fat-cells of normal connective tissue, but, as Török has shown, they never go on to the formation of a fully developed cell containing one large drop of fat, and Unna finds they do not respond to staining and other tests as do the fat-containing cells found in other tissues. There is seen also in the growth a transitional series of bodies between the connective-tissue corpuscles and the characteristic "xanthoma-cells."

The epidermis is usually unchanged, though it, together with the papillary layer, may be slightly thinned, and there is frequently a deposit of a yellowish-brown pigment in the deeper layers of the rete. The growth is almost wholly confined to the deeper parts of the corium, though occasionally portions extend to the subcutaneous tissue and may surround the coil-glands and hair-follicles. The sebaceous glands may be few, but are unchanged and are not, as was formerly supposed, concerned in the process. There is often a deposit of pigment in the corium, both free and in the cells, but the characteristic color of xanthoma is undoubtedly due to the fat-granules.

The icterus and hypertrophy of the liver which sometimes complicate xanthoma are probably secondary and caused by the presence of the growth in the liver or in the biliary passages.

Pollitzer¹ states that eyelid xanthoma is due to a slow fatty degeneration of the fibres of the orbicularis muscle analogous to the more rapid degeneration of muscles which sometimes follows acute infectious diseases. He finds the xanthoma-bodies to be fragments of degenerated muscle-fibres, and believes that this form of the disease has no connection whatever with the generalized forms.

Chambard, Morris, Crocker, and a few others believe the primary process is an inflammation which is followed by a fatty degeneration of the cells.² Balzer's conclusions as to the parasitic nature of the disease have not been verified by more recent investigators.

Diagnosis.—Milia occasionally occur in groups in the form of oval plaques upon the lids, but are distinguishable from xanthoma by the possibility of expressing their contents.

The diagnosis from all other lesions is readily made when consideration is had of the peculiar yellowish or saffron-like hue of xanthoma, and the common situation, form, and general characteristics of its plane or nodular lesions.

Pollitzer has reported a case of multiple dermoid cysts in which were present the clinical appearances of xanthoma. A similar case has been under our observation. Another is reported by Pringle.³

When xanthoma is represented by a single lesion upon the skin, the diagnosis may be attended with some difficulty. The distinctive differences between xanthoma and xanthoma diabeticorum are detailed in connection with the description of the disease last named.

¹ J. C. D., 1897, xv., p. 367.

² A discussion of this question and a *résumé* of literature are found in B. J. D., 1892, iv., p. 237 et seq.

³ B. J. D., 1903, xv., p. 292.

Treatment.—Erasion and excision are the usual methods of removing xanthoma. Care should be taken in such operations to avoid a consequent ectropion when the operation is performed upon the skin of the eyelids. The Paquelin knife is objectionable on account of the radiation of heat to the globe of the eye. With the tumor slipped through an aperture in a thin sheet of asbestos paper, such as now is found in the market, this danger may be obviated. Morrow employs 25 per cent. salicylic acid plaster. Roberts makes a salicylated collodion paint—2 parts of salicylic acid, 1 each of chrysarobin and castor-oil, and 4 of flexile collodion.

The modern method, however, of treatment by electrolysis is preferable to others. The technique is the same as that employed for hypertrichosis and for the removal of soft moles. Caustics also have been employed successfully. Besnier employs phosphorus internally, followed by turpentine, by which the course of the disease is said to have been relieved. Wilson, with the same end in view, employed nitro-muriatic acid, bitters, and blue pill. McGuire reports the removal of xanthoma by applications of monochloroacetic acid.

Prognosis.—The lesions, when not removed, are liable to persist through life. Spontaneous involution is said to occur very rarely. Some cases of xanthoma tuberosum, with xanthochromia and involvement of the inner coats of the larger vessels, prove serious.

XANTHOMA DIABETICORUM.¹

(GLYCOSURIC XANTHOMA.)

Xanthoma diabeticorum is a rare eruptive disease, occurring in the subjects of glycosuria, characterized by the development on the skin of multiple non-inflammatory, whitish, globoid papules, with a reddish base, resembling pustules and productive of mild subjective sensations. This disorder has been well illustrated by three excellent portraits showing the features of the malady in a case reported by Robinson.² Instances of the disease have been recorded also since the cases of Addison and Gull (1851) by Hillairet, Morris (who was the first to claim for it an independent position in the list of cutaneous affections), ourselves,³ and many others.⁴ It is a disorder affecting more often glycosuric than diabetic patients, and as it is not demonstrably a xanthomatous affection the name by which it is recognized most commonly is doubly unfortunate.

Symptoms.—The lesions are usually multiple and exceedingly numerous, discrete, or confluent, and not rarely grouped, pinhead-to pea-sized, firm, well-defined, conical, or acuminate papules. At the apex may be recognized a yellowish centre with reddish areola,

¹ For bibliography, see Leven, *Archiv*, 1903, lxvi., p. 61.

² *Internat. Atlas*, 1890, iv.

³ Paintings in oil showing the lesions in two patients were exhibited to the Amer. Derm. Assoc. in New York, 1898.

⁴ Pusey and Johnstone, *J. C. D.*, 1908, xxvi., p. 552, six figures.

PLATE XXX



Xanthoma Diabeticorum



which may be made to disappear temporarily under pressure. The appearance when viewed at some distance is suggestive of a pustule. Subjective sensations of itching, pricking, etc., may be produced. The lesions are visible over the buttocks, loins, elbows, knees, and extensor faces of the limbs in general, the scalp, face (brows, lips, nose), about the angles and over the mucous surface of the mouth, and the palms and soles. But one case has been reported as occurring on the eyelids.

The eruptive lesions are likely to be of sudden occurrence and abundant at the outset. They may be firm but are generally soft and compressible to the touch. Occasionally they occur as punctate, linear, riband-shaped, or flattened lesions. In a large number of patients with trunk-lesions the abdomen is fat-distended. After remaining upon the surface for a few months or years they may wholly disappear without leaving a trace of their existence, or the eruptive elements may in part only disappear. Under appropriate treatment they may disappear with surprising rapidity.

Etiology.—In seventeen of twenty-one cases reported, glycosuria has been recognized, and Johnston calls attention to the fact that in nearly every case the patient has been described as stout, florid, or obese. The majority of the patients have been male subjects and usually in a condition of fair nutrition; often they have been consumers of beer in large quantities. In yet other cases, especially in young subjects, there is malnutrition, and even cachexia. The patient under our observation, whose genitalia are represented in the accompanying plate, suffered from diabetes insipidus, passing over a gallon of water daily without a trace of sugar. He suffered from chills and was undersized. In other cases albuminuria, nephritis, and jaundice have been present.

Pathology.—Histologically the disease does not differ essentially from the ordinary form of xanthoma, except that inflammatory changes are more marked, there is less connective-tissue formation, and there are fewer of the xanthoma-cells than in the common variety. The lesions, moreover, are found usually near the coil-glands and follicles. Török, Johnston, and others believe the disease to be an exudative dermatitis, terminating in a granulo-fatty degeneration which is quite distinct from the heterotopic, arrested development of fat seen in ordinary xanthoma. A number of the cases which have been reported are simply cases of xanthoma in diabetic patients.

Diagnosis.—The difference between xanthoma and xanthoma diabeticorum is based upon the following points: In xanthoma of glycosuria the sudden evolution and involution of the cutaneous lesions, the occasional firmness and solidity of the latter as distinguished from the softness of the ordinary forms, and the appearance of inflammation in the glycosuric as distinguished from the hypertrophic changes in the other variety. In xanthoma diabeticorum the yellowish apex is not at first apparent (though it may be wholly wanting), nor in all the lesions, and when it exists is due to epidermal changes, and

not to those occurring in the corium, as in xanthoma. Other characteristic features of the xanthoma of diabetic subjects are the frequent absence of striæ and patches, of jaundice, and of eyelid-lesions, the presence of mild subjective sensations, the grouping of the lesions about the hair-follicles (well marked in Robinson's case), and the absence of diabetes mellitus in most of the palpebral cases on record. This side of the question is presented by Johnston in reporting a case and in giving a summary of the twenty others.¹

On the other hand, it is urged by Besnier and Doyon that the glycosuria is simply an irritating cause which explains the differing symptoms of xanthoma in the two classes of patients. Surveying the literature of xanthoma, they find patients without diabetic symptoms suffering from atrocious pruritus and most of the special features claimed as peculiar to diabetic xanthoma of glycosuria. A woman, however, in middle life, recognized as the subject of diabetes mellitus (not insipidus), examined with special care, exhibited merely the common form of symmetrical and plane eyelid-lesions. It is difficult to determine what are the relations, if any, between these two forms of xanthoma.

Treatment.—The treatment of the disease, medicinal and dietetic, is largely that of glycosuria. Robinson's patient recovered after the use of small doses of Fowler's solution. Local treatment may be employed as indicated in any case.

Prognosis.—The prognosis is favorable, the majority of the patients eventually recovering.

PSEUDO-XANTHOMA ELASTICUM.

There are but few cases of this affection on record.² Balzer reported the first case in 1884. Our knowledge of the disease has been enhanced by Chauffard, Darier, and Bodin.³ The eruption consists of a single or of several rather large chamois-colored plaques. They are slightly elevated and resemble xanthoma. The individual lesions are pin-head-sized nodules, which are discrete on the peripheral portion and confluent in the central part of the plaque. In some of the cases the disease developed in the advanced stages of pulmonary tuberculosis. (*Cf.* p. 582.)

COLLOID METAMORPHOSIS OF THE SKIN.⁴

(COLLOID MILIUM [Wagner], HYALOMA. *Fr.*, COLLOÏDOME MILIAIRE [Besnier]; *Ger.*, HYALOM DER HAUT.)

Relatively few cases of this rare disorder have been reported. The lesions occur chiefly on the upper two-thirds of the face, especially on the forehead and about the orbits. In C. J. White's case⁵

¹ J. C. D., 1895, xiii., p. 401; and *ibid.*, 1900, xviii., p. 387.

² Hallopeau, *Annales*, 1903, s. iv., iv., p. 595.

³ Bodin, *Annales* 1900, s. iv., i., p. 1073.

⁴ For full bibliography, see Juliusberg, *Archiv*, 1902, lxi., p. 175.

⁵ J. C. D., 1902, xx., p. 49 (with review of literature).

the backs of the hands also were involved. They consist of pin-head-to millet-seed- or even split-pea-sized, sharply circumscribed, irregularly rounded, flat papules, lemon-yellow in color, having a peculiar glistening, translucent appearance suggestive of vesicles. They project but slightly from the skin, and, on puncture, give exit to a soft, gelatinous mass, at times accompanied by a droplet of blood. Some of them may be surrounded by very slight telangiectases. They develop slowly, often in groups, the individual papules remaining distinct even when two or more unite. Frequently a papule becomes depressed in the centre; or becomes inflamed and covered with a crust which falls and leaves a shallow depression but not a true scar.

Etiology.—The cause of the disease is not known; it occurs alike in men and women, usually after the forty-fifth year of age. A male patient presented at our clinic was twenty-five years of age only. In most of the cases reported the individuals lived an outdoor life and were much exposed to the elements.

The **Pathology** has been studied by Balzer, Besnier, Reboul, and others. Wagner's belief that the process begins in the sebaceous glands is now practically discarded. Colloid degeneration is found to affect the connective-tissue and elastic fibres of the derma, which may become involved over considerable areas. The changes are especially noticeable about the vessels and nerves and about the sebaceous and coil-glands. The glands themselves, and all the epithelial structures, except the endothelia of the vessels, usually escape. In sections examined by us removed from a clinical patient a few rete-cells and a few cells of the coil-gland ducts were transformed into or infiltrated with colloid substance. This disease is not identical with multiple benign cystic epithelioma (hidradenoma), in which the epithelial cells play an important part.

Diagnosis.—The disease is apt to be confounded with xanthoma, hydrocystoma, adenoma sebaceum, and multiple benign cystic epithelioma (hidradenoma). From the last-named disease the diagnosis is often very difficult or even impossible without the aid of histological examination.

Treatment.—The nodules may be removed with a sharp curette or by electrolysis.

CALCIFICATION OF THE SKIN.

This unusual condition was described by Thimm¹ occurring in the case of a male patient, aged twenty-three years. There was a hard, moderately elevated tumor of eight years' duration, one cm. in diameter, situated on the dorsal aspect of the proximal phalanx of the left little finger. The lesion was described as yellowish white in color, having a warty center, and composed primarily by the coalescence of hemp-seed-sized whitish nodules.

A microscopic study revealed masses of calcareous material in

¹ On Calcification of the Skin, *Archiv*, 1902, lxii, p. 163; abstr. B. J. D., 1903, xv., p. 223.

the situations of the pilo-sebaceous follicles and also between the fibrous bundles of the corium. The fibrous elements formed in areas a framework for the chalky deposits. There was, in addition, the usual picture indicative of a chronic inflammatory process. The writer's conclusion was that as the result of a sebaceous gland change, retention cysts formed which later underwent calcarous degeneration.

In a case reported by Remes,¹ the rim of the right ear was involved. Histologically, the entire thickness of the cutis was occupied by a deposition of calcareous masses in a net-like granulation tissue. Giant cells were present in abundance. The pathogenesis of the condition he explains by assuming a degenerative change in the tissue preceding the calcification, which change was induced by some form of chronic irritation (pressure during sleep?) acting upon a part having low resisting powers.

Calcareous degeneration is described by Gilchrist² and Stokes in peculiar bodies found in the lupus-like tissue. Calcareous deposits have also been noted in connection with milia.

ADENOMA OF THE SEBACEOUS GLANDS.³

(ADENOMA SEBACEUM. *Fr.*, ADÉNOMES SÉBACÉS [Balzer and Menertrier], ADÉNOMES SÉBACÉS CANCROÏDAUX, ACNÉ CANCROÏDALE.)

The several forms of adenoma of the sebaceous glands may be assigned to two categories, the benign and the malignant.

Acquired Benign Growths are pin-head- to pea-sized, sessile, spheroidal, oval, or acuminate bodies, occasionally presenting points of whitish appearance suggestive of milium. They are situated chiefly over the face (forehead, furrows beside the nose). They are always covered with an unchanged epithelium and in color present the hue of the normal skin.

Congenital Benign Growths are represented by the verrucous and vascular naevi of Pringle and Darier. They increase slowly after birth and attain a notable development at about the period of puberty. They also are found about the regions of the face named above, including the chin and the mouth. The lesions are pin-head- to bean-sized, and differ from those above described chiefly in the color they present, which varies from a yellowish white to a deep brownish red; often the surface is vascularized by the presence of minute capillaries. They are sometimes discrete, often confluent, and may be commingled with comedones, acne-pustules, pigmented patches, and the lesions of facial seborrhœa. In the majority of cases other defects of the skin, such as warts, naevi, small papillomata, and pigment-spots, are present, while many of the patients reported have been mentally deficient or epileptic.

¹ Archiv, 1907, lxxxviii., p. 265 (with résumé of reported cases).

² The Presence of Peculiar Calcified bodies in Lupus-like Tissue, J. C. D., 1903, xxi., p. 463.

³ For bibliography, see Darier, La Pratique Dermatologique, t. i., p. 284; Pezzoli, Archiv, 1900, liv., p. 192; Pick, Ibid., 1901, lviii., p. 201; Marullo, Zeitschrift, 1902, ix., p. 166; Kothe, Archiv, 1904, lxxviii., p. 33.

The two forms named above are benign lobulated tumors of the type of sebaceous adenoma, the last-named group being distinguished by delicate telangiectases over the surface and a verrucous structure.

Malignant forms of Sebaceous Adenoma occur when the skin is in the senile state. They begin with the symptoms of an irritable acne or seborrhœa, greasy crusts being displayed here and there, particularly over the surface of the face; or with comedones of unusual type; or with papulo-pustules that do not pursue the course of those seen in earlier years. Ulceration attacks the lesion which at first seemed benign, and the issue is the development of an epithelioma. Pick¹ reports a case in which small epitheliomatous tumors formed similar to those seen in multiple benign cystic epithelioma (*q. v.*).

Etiology.—These growths are developmental defects of the skin which frequently appear for the first time in adult life. Most of the cases reported have been in the poor and in those of defective mental development, but cases are seen also in the well-to-do and intelligent.

FIG. 107.



Adenoma sebaceum (Heldingsfeld).

Pathology.—The histology of these bodies has been studied by Pringle, Darier, Balzer, Crocker, Pollitzer, and others. There is hyperplasia of the sebaceous glands, which are numerous and large. Beyond this observers do not agree, and further study of the subject is necessary. Pringle described an interpapillary hypertrophy; Bal-

¹ Loc. cit.

zer found small cysts in both sebaceous and sweat-glands; Crocker reported an increased development of the coil-glands and hair-follicles, in addition to hyperplasia of the sebaceous glands.

Diagnosis.—The history of the disease, which begins in early life and develops gradually; the persistency and permanency of the individual lesions situated chiefly on the middle of the face and specially in the naso-labial folds; the frequent occurrence of telangiectases with the papules above described; and the absence of suppuration or ulceration will usually suffice for a diagnosis. In colloid milium the lesions are usually few in number, are situated chiefly on the frontal and orbital regions, have a peculiar yellowish, translucent appearance, and are not so much modified by telangiectases. In multiple benign cystic epithelioma the lesions occur on the forehead and also on the trunk. Both of the two last-named diseases, however, may so closely resemble adenoma sebaceum as to render the differential diagnosis impossible without the aid of histological examination.

Treatment.—Neither internal remedies nor external applications have any influence upon the lesions. The treatment is, therefore, surgical and calls for the employment of the knife, the curette, or scarification, depending upon the size, number, and location of the lesions. In several cases the latter have been removed successfully by means of electrolysis.

MULTIPLE BENIGN CYSTIC EPITHELIOMA.¹

(TRICHOEPITHELIOMA PAPULOSUM MULTIPLEX; HEMANGIO-ENDOTHELIOMA; LINEAR NÆVI.)

Much confusion has existed respecting this disorder described from different points of view by different writers as shown by the titles given above. The following description practically covers the clinical

¹ Bibliography: Balzer and Menetrier, *Archiv de Physiol.*, 1885, vi. Balzer and Grandhomme, *Archiv de Physiol.*, 1886, vii. Birch-Hirschfeld, *Allge. patholog. Anatomie*, 1890. Blaschko, *Berlin Dermatol. Soc.*, June 14, 1898. Brooke, B. J. D., 1892, iv., p. 269; *Monatshefte*, 1892, xv., p. 589. Christian, *Dissert.*, Berlin, 1903. Crocker, "Diseases of the Skin," 3d ed., p. 988, and *Trans. London Clinical Soc.*, 1899, xxxii., p. 151. Csillag, *Archiv*, 1904, lxxii., p. 175; *ibid.*, 1906, lxxx., p. 163. Delbanco, *Münch. med. Wochensh.*, 1901, No. 39. Dohi, *Archiv*, 1907, lxxxviii., p. 63. Dorst and Delblanco, *Monatshefte*, 1901, xxxiii., p. 317. Fellander, *Archiv*, 1905, lxxiv., p. 203. Fordyce, J. C. D., 1892, x., p. 467; *ibid.*, 1890, viii., p. 459. Fox, B. J. D., 1897, ix., p. 230 (case report). Gassman, *Archiv*, 1901, lviii., p. 177. Gottheil, J. A. M. A., 1901, xxxvii., p. 176. Guth, *Archiv*, 1900, (*Festschr. Kaposi*). Hartzell, B. J. D., 1904, xvi., p. 361. Hallopeau, *Annales*, 1890, s. iii., i., p. 872. Heidingsfeld, J. C. D., 1908, xxvi., p. 18. Jamieson, B. J. D., 1893, v., p. 138. Jarisch, *Archiv*, 1894, xxviii., p. 163. Kleintjes, *Dissert. München*, 1904. Kreibich, *Derm. Zeitsch.*, 1906, xi., p. 675. Krzysztalowicz, *Monatshefte*, 1907, xlv., p. 1. Lesser and Beneke, *Virchow's Archiv*, 1891, cxiii. Perthes, *Deutsch. Zeitsch. f. Chir.*, lxxv. Phillipson, B. J. D., 1891, iii., p. 33. Piek, *Archiv*, 1901, lviii., pp. 201 and 215. Pollitzer, J. C. D., 1891, ix., p. 281. Poor, *Monatshefte*, 1905, xl., p. 379. Pringle, B. J. D., 1890, ii., p. 1. Reitmann, *Archiv*, 1907, lxxxiii., p. 177. Sagory, *Thèse de Paris*, 1906. Thiersch, *Archiv*, 1904, lxix., p. 3. Wilhelm (Vienna *Derm. Soc.*, Feb. 8, 1905), *Archiv*, 1905, lxxvi., p. 417. Wolters, *ibid.*, 1901, lxx., pp. 89 and 197. Werner and Jadassohn, *ibid.*, 1895, xxxiii., p. 355. Werther, *ibid.*, 1907, lxxxviii., p. 334. White, J. C., J. C. and G. U. Dis., 1894, xii., p. 474.

appearances recognized by most observers excluding all cases of syringocystoma.

Symptoms.—The lesions occur most often in the face (about the root of the nose, the temples, eyelids, cheeks, forehead, and chin), the neck, the mammary glands, and upper extremities but may develop in any part of the body. The lesions are minute, pearly, pale, yellowish or pinkish tumors, sometimes yellowish red, even at times having a bluish shade, varying in size from a small pin's head to that of a pea though much larger lesions may develop. They are firmly imbedded in the skin; project to a variable degree above the surface; are round or oval, solid and painless to the touch, the larger tumors being tense, lucent, and freely movable over the underlying tissue, and develop slowly, the growth ceasing after a time. In some cases the lesions are translucent and suggest in their appearance vesicles; others resemble milia; still others may be the seat of fine telangiectases; in yet others there is a central depression sometimes having a blackish point. These central points at times represent the partial cicatrix of a small ulcer. Lastly there are those which resemble crateriform epithelioma. The lesions are discrete and not in any way characteristically grouped. They are not as a rule the seat of subjective sensations, most patients applying for relief on account of their appearance when developed on the face. In some instances they are symmetrically arranged though not grouped.

Etiology.—The disease occurs most often at about the period of puberty, in women more frequently than in men. In some cases there is distinctly inherited tendency to the disease.

Pathology.—The reports on the pathological findings in different cases differ according to the point of view of the investigator. Heidingsfeld for example, recognizing the hyperplasia of the sebaceous glands and, comparing this change with that occurring in lymphangioma tuberosum multiplex originating chiefly in the lymph- and blood-vessels, finds that these affections have a common pathogenesis from misplaced embryonal tissue.

Fordyce recognized irregularly rounded, oval, elongated masses and tracts of epithelial cells corresponding to those in the lowermost layer of the epidermis and the external root-sheath of the hair-follicle. The epithelial masses may be distinct, or made up of intercommunicating bands and tracts, in some places resembling coil-ducts. "Cell-nests" are met with as in malignant epithelioma, enclosing horny, granular, and colloid tissue. Colloid degeneration of individual cells is also encountered in the cell-masses. The connective tissue about the cell-collections is somewhat condensed, but is not the seat of any inflammatory process.

Jarisch, White, Hallopeau, Wolters, Pick, and Hartzell practically agree with the findings described above, recognizing the infiltration of the derma with irregular or ramifying epithelial masses clearly defined, often with distinctly colored cells, disposed at the periphery "like a palisade" with more or less central degeneration where may also be found a cyst.

See and others have recognized in the corium variously sized, distended, sometimes swollen cysts in great numbers having epithelial walls and stuffed with colloid masses.

Dubreuilh and Auché¹ found large numbers of connective tissue cells at the periphery of the tumors with plasma-cells and a few mast-cells. The sweat and sebaceous glands were not involved.

Treatment.—The growths can be removed by all surgical measures; by radiotherapy; by electrolysis; by liquid air; or by pencils of frozen carbon dioxid.

Prognosis.—A large majority of all cases terminate favorably. Many make no progress toward degeneration after years without treatment. In but very few cases malignant growths develop.²

SYRINGOCYSTOMA.³

(HIDRADÉNOMES ÉRUPTIFS [Jacquet and Darier]; SYRINGO-CYSTADÉNOME [Török]; EPITHÉLIOME KYSTIQUE BÉNIN [Jacquet]; CELLULOME ÉPITHÉLIAL ÉRUPTIF [Quinquaud]; CYSTADÉNOME ÉPITHÉLIAL BÉNIN [Besnier]; LYMPHANGIOMA TUBEROSUM MULTIPLEX [Kaposi]; ADENOMA SEBACEUM; ACANTHOMA ADENOIDES CYSTICUM; SYRINGOCYSTOMA [Neumann]; SYRINGOMA [Fiocco]. *Ger.*, SCHWEISSDRUSEN ADENOM MIT CYSTENBILDUNG.)

A group of rare cases, less than two score in number, the first described by Darier and Jacquet; others later by the observers whose names are given above, and yet others quite recently by C. J. White, of Boston, has been definitely recognized as distinct from the conditions commonly described as multiple benign cystic epithelioma. The clinical picture of syringocystoma is now fairly differentiated from others.

Symptoms.—The patients are for the most part women in early life, exhibiting an odd-looking eruption in the form of distinctly outlined patches over the neck, clavicles, shoulders, and chest, but especially over the axillæ, more rarely over the face, eyelids, nose, ears, scalp, abdomen, and extremities. In a patient examined by us the lesions were equally characteristic but less numerous in the groins. The general health of the subjects of the disease is unimpaired. There are few, if any, subjective sensations.

The eruptive elements are pinhead to split-pea-sized (in Braun's case they attained the size of a hazel nut), roundish, rather closely set, smooth, globoid nodules, in some cases discrete, in others so closely packed as to assume the shape enforced by the juxtaposition

¹ *Annales*, 1903, s. iv., p. 53.

² *Annales*, 1902, iv., s., iii., 545.

³ Partial Bibliography: Darier, *La Prat. Derm.*, 1900, i., 288; White, C. J., J. C. D., 1907, xxv., 49, full bibliography, four plates, six histological figures; Jacquet and Darier, *Annales*, 1887, s. ii., viii., 317, with plate; Jacquet, *Congrès Intern. de Derm. Paris*, 1889; Perry, *Atlas of Rare Skin Dis.*, 1890, Pt. 3, Pl. 9; Neumann, *Archiv*, 1900, liv., 3; Brauns, *Archiv*, 1903, lxiv., 347; Fiocco, *Giorn. Ital. d. Mal. Ven. e. d. Pel.*, 1904, 3; Besnier, *Trans. of Kaposi's Treatise*, ii., 367.

PLATE XXXI



Syringocystoma



of neighboring lesions. They are softish in consistency, fawn-colored to yellow in some subjects, in others having a brownish almost a chocolate-tinted hue. They produce no sense of roughness to the touch when handled, and being in moist situations suggest that they are to a degree macerated with sweat coming from the sound adjacent skin. They arrange themselves usually along the natural folds of the skin.

The course of the disease is toward persistence of the lesions after attaining a maximum development when not removed by treatment.

Histopathology.—The essential change, according to Darier and White, is to be recognized in the corium, the papillary and sub-papillary layers of which are practically unchanged. Between the sub-papillary layer and the panniculus adiposus lie clusters ("epithelial cylindrical tracts") of epithelial cells, variously shaped, surrounded by a connective tissue which seems to have undergone collagenous degeneration. Within the clusters a central lumen develops, with round, swollen, translucent, granular cells often blocked with "globes" of colloid material. In the case of Jacquet and Darier, there were ramifying prolongations in the corium showing canals, and cysts with amorphous contents; while in Neumann's exceptional case, the rete-pegs, the vessels, sebaceous glands, and arrector muscles were changed. In but a few of the recorded cases has a distinct connection between the cysts and the sweat-coils been demonstrable. White in summing up the conclusions of similar cases believes that the disorder is a hyperplastic and hypertrophic change in previously existing efferent sweat-ducts.

Diagnosis.—The diagnosis is to be established chiefly from multiple benign cystic epithelioma, the softish nodules of syringocystoma with their general hue, distribution, and lack of pearly elements, rendering the clinical recognition facile. Papular syphilodermata are, as a rule, accompanied by other signs of lues; the xanthomata have a more yellowish tint but in many respects strongly resemble the lesions of syringocystoma.

Treatment.—The treatment recommended by Darier and Brocq is by electro-cauterization or excision.

XERODERMA PIGMENTOSUM.¹

(Gr., ξερός, hard; δερμα, the skin.)

(ANGIOMA PIGMENTOSUM ET ATROPHICUM; ATROPHODERMA PIGMENTOSUM, DERMATOSIS KAPOSI, MELANOSIS LENTICULARIS PROGRESSIVA, LIODERMA ESSENTIALIS CUM MELANOSI ET TELANGIECTASIA, LENTIGO MALIGNA. *Fr.*, EPITHÉLIOMATOSE PIGMENTAIRE.)

Xeroderma pigmentosum is a rare disease, described by different authors under the several titles given above, but most often designated by the name given as the title of this section. It was recognized

¹Bibliography: Kaposi, *Wien. med. Wehnschrft.*, 1885, p. 1334; *Ibid.*, *Twentieth Century Practice*, vol. v., p. 727; Lukasiewicz, *Archiv*, 1895, xxxiii., p. 37

first and described by Kaposi, in 1863, on the basis of two cases seen by the elder Hebra and himself, this number being increased by two in the year 1870. Since then more than one hundred cases have been placed on record in different countries, and about a score in America by Taylor, Duhring, White, Bronson, Drayton, Hutchins, Bowen, and others, including the author. Recently we have studied the disease in three children of one family, the patients being the subject of the illustrations of the disease in the present edition of this treatise.

Symptoms.—The disease begins most often in early life, from the third or the fifth month to the close of the first year, though it has been observed first in adults and even at an advanced age. Some

FIG. 108.



Xeroderma pigmentosum.

doubt however, exists as to the occurrence of classical features of the malady in the cases developing at these later periods.

The special stigmata of xeroderma pigmentosum are its symptom-groups, any one of which may be encountered not rarely in other

(*résumé* of seventy-three cases, and bibliography); Kreibich, *Archiv*, 1901, lvii., p. 123; Monthus, *Annales*, 1902, s. iv., iii., p. 673; Löwenbach, *Mraček's Handbuch*, Bd. iii., p. 240 (with full bibliography); Crocker, *Diseases of the Skin*, 3d ed., p. 681; Herkheimer u. Hildebrand, *Münch. med. Wehnschrft.*, 1900, xlviii., p. 1099 (full abstr. in *B. J. D.*, 1901, xiii., p. 66); Nicolas and Favre, *Annales*, 1906, s. iv., vii., pp. 536-549, Michael Terterjanz, *Inaug.-Dissert.* Berlin, 1902; Klein, *Inaug.-Dissert.*, Strassburg, 1906; Terebinski, *Russki Wratsch.*, 1906, No. 48; Vignolo-Lutati, *Monatsh.*, 1907, xlv., pp. 21-31, 72-91; Josef Cuszman, *Centralb.*, 1907, x., pp. 258-267; Low, *Zeitsch.*, 1906, xiii., pp. 488-498; Förster, *Deutsche. med. Zeit.*, 1904, No. 74, 77; Adrian, *Centralbl.*, 1904, vii., 130; Askura, *Japan, Zeits. f. Derm. u. Med.*, 1906, p. 1 (2 cases).

diseases, but the complexus of which is scarcely to be seen in any other affection, and in particular at an early period of life. The term, *senilitas præcox*, has been applied aptly to the condition of the young subjects of the disorder. An analysis of the phenomena presented in a well-marked case shows that pigmentation, atrophy, telangiectasis, and new-growth development coexist.

FIG. 109.



Xeroderma pigmentosum.

At the outset, the mothers of children and some observant physicians have seen an erythematous redness, diffuse or in circumscribed maculæ, over the regions later characteristically involved. More often the first signs of the disease are visible in a well-marked freckling of the skin, the lentigines scarcely if at all differing from those resulting from exposure to the light in persons subject to that form of pigmentation. This freckling, or pigmentation, in almost every instance involves the exposed surfaces of the body, more particularly the face, neck, upper chest as far as the third rib, the hands, the forearms from the upper third as far as the finger-tips, including to a minor extent the flexor aspect of the arms and the palms. In our little patients there was a distinct triangulation of pigmentation, the apex of the triangle below extending down the back nearly to the sacrum. Occasionally the thighs, the legs, the scalp, the sub-ungual

spaces, the dorsa of the foot, the trunk, and buttocks may likewise be involved.

The patients are commonly of blond type, with reddish or light-tinted hair and blue or lightly pigmented irides; in short, of the class chiefly disposed to freckling. The pigmentations in these cases differ as to hue with the age of the patient and the severity of the disease, the color ranging from a light fawn-yellow to a deep chocolate-brown. The lentigines may be isolated, as is the rule; or be fused in areas of one or several centimetres diameter.

Interspersed among the lentigines are equally characteristic whitish atrophic spots, usually less pronounced than the lesions described above, which may be isolated or coalesce into cicatriform patches. When sparse, they are somewhat lucent, slightly wrinkled, smooth, or covered with micaceous scales. They may precede the occurrence of the pigmentations or follow the latter, or even follow the development of the telangiectases described below. Crocker ascribes to these atrophic areas the production of ectropion, which is a common feature of many cases; but in our experience the ectropion results from epitheliomatous infiltration of the lower lids, precisely as in epitheliomatosis of adults.

The telangiectases, which are equally common and characteristic of the disease, may be punctate or stellate; they are usually fine and conspicuous by contrast with the pigmented skin in which they develop though they may result in minute pinhead-sized tumors of the skin not rarely observed on the trunk of men and women of advanced years. They may be few or numerous, and are less conspicuous as a rule on the surfaces covered with the clothing than elsewhere in the regions exposed to the light.

The new-growths visible in the victims of the disease vary greatly in type, but we believe that all are epitheliomatous in character, the different clinical features described by observers not suggesting a wider variation than can be determined in any study of the clinical appearances of epithelioma in the skin of persons of advanced years, including the lesions seen in that class of subjects described as verrucous, papillary, discoid, fungating, deep-seated, rodent ulcer, etc.

Thus, for example, in xeroderma pigmentosum there may be pea-sized or larger, flattened or pointed warty growths, irregularly disseminated among the lentigines, or conspicuously developing at isolated points, such as the back of the hand or in front of one ear. In other cases there is a distinct circumscribed epitheliomatous infiltration not productive of a tumor, cases of the sort referred to above, where ectropion ensues precisely as in the case of aged persons with carcinoma of the tissues in or near the lower lid.

The other symptoms of xeroderma pigmentosum are related more or less closely to the chief lesions described above. There may be open or crusted ulcerations resulting from circumscribed epitheliomatosis. In one of our patients, a boy four years of age, a lesion developed in the tragus of one ear which might serve as a classical illustra-

tion of the "rodent ulcer" of English writers. Healing of such ulcers may result further in deforming cicatrization. Papillomatous tumors, developing from cicatrices or directly from freckle-like lesions may assume eventually epitheliomatous characters. Keratitis is exceedingly common, and this in the early periods of the disorder accompanied by photophobia, profuse semipurulent lachrymation, and, according to Crocker, producing extension of the disease by the flow of the secretion over the cheeks. Corneal opacities, sufficient to obstruct vision even in the very young, occur to a grave extent. A profuse catarrhal discharge from the nose, with extension of the disease to the Schneiderian membrane and also to the inner faces of the lips and buccal cavity, may result. The scalp may be free, or the seat of pityriasis scaling or of lentigines. Sensation and perspiration may be impaired to a varying extent. Often, as the disease progresses, a characteristic thinning of the affected integument occurs, producing the so-called parchment-skin.

In very young subjects the partially blind patient has an apathetic expression and listless demeanor which are highly characteristic. The course of the disease is variable; some of the children dying of marasmus in the course of a few months; others surviving to adult years. The disease may seem for months at a time to be arrested, after which it may be reawakened to activity.

Audry reports,¹ an exceedingly rare case in which xeroderma pigmentosum developed without pigmentation in a male patient, 24 years of age, an epithelioma of the lower lip developing between the third and fourth year of life. The author, as a consequence, places in the first rank of symptoms of this disease the redness, the vascularization, the atrophy, and the pseudo-ichthyosis of the skin; and calls attention to the fact that all other symptoms may be lacking, the epitheliomatous being only a superadded change. Audry does not hesitate to declare absolutely that on the basis of pathological findings there is no connection, in fact, an absolute distinction, between, the cases of xeroderma pigmentosum in childhood and those reported as occurring late in life.

A number of cases of xeroderma pigmentosum have been reported as first occurring in adult years and even at an advanced age. There is however, some doubt as to whether those first suffering at this age should be included in the class with the childhood cases. Thus, for example, Beurmann and Gougerot,² report details of the case of a male patient (67 years of age) affected with a gastric epithelioma, whose symptoms closely simulated those of xeroderma pigmentosum, viz., minute multiple angiomas distributed over the exposed parts of the body (head, etc.), with whitish atrophic points having a pigmented areola, accompanied by puncta of hyperpigmentation about the head and trunk. On the other hand Sequeira³ reports an un-

¹ *Annales*, 1907, s. iv., viii., pp. 199-204.

² *Annales*, 1906, s. iv., vii., p. 391.

³ *B. J. D.*, 1906, xviii., p. 203.

doubted case in a man 26 years of age who had suffered since early childhood.

Etiology.—The cause of the disease is unknown, but the records indicate clearly that in many cases there is a strongly marked family predisposition to the disease, not merely because of the frequency with which several members of one family have been affected, but also because of the consanguinity of a few families with children similarly attacked. About twenty-four per cent. of all the recorded cases occur in the families of Israelites. The disease is represented equally in the two sexes; many brothers and sisters of affected children are free from the disease. Beginning for the most part in the first year of life, a few senile instances have been reported in which the earliest symptoms were declared at an advanced age. The influence of light upon the development of the disease in susceptible subjects has been pronounced effective by several authors, and while it is true that, as in one of our cases, the lower limbs and trunk, as well as the dorsa of the feet, were involved, the preponderance of testimony decidedly points, in the victims of the disorder, to an extreme susceptibility of the skin to the action of sunlight, an agency by no means set aside when the light clothing of many young subjects envelops the skin.

Pathology.—The disease seems to be a cutaneous metamorphosis, the primary factor in which is less a primary neurosis, as has been taught, than a special susceptibility to the action of the light-rays, a fact declared in the well-nigh invariable ocular symptoms developed in the subjects of the disease. Whether the morbid process is primarily degenerative, or is rather, as the facts tend to show, at the outset reactive in the line of erythematous redness followed by degenerative changes, remains to be seen. In Adnou's case (child 23 months old) there was diminished hemoglobin and increased erythrocytes.

Bandler,¹ in the histological examination of a patient, 24 years old, under his charge, found that the morbid process was limited to the epidermis and the upper corium and the blood vessels of the connective tissue while the deeper cutis and hypoderm remained intact. The author found evidences of typical epithelioma and in one place alveolar nævus carcinoma.

The two tumors examined presented a difference in characteristics, one that of a typical epithelioma with little tendency to enlargement having limitations; the second that of carcinoma with irregular proliferation, atypical in type with degenerative tendencies.

The tumors and warty growths developed in the course of the disease have been examined repeatedly in section with findings variously interpreted. Okamura recognized an oligocythæmia and leukocytosis in Kaposi's cases; Crocker, Vidal, Taylor, and Kreibich describe practically the same condition, though variously interpreted by them—viz., epitheliomatous nests, aggregations of long branching cylinders enclosing epithelial cells ("tubular" type, of cancer), and, ac-

¹ Archiv, 1905, lxxvi., pp. 9-30.

cording to Pollitzer, "mixed elements," sarcomatous, myxomatous, sarco-carcinomatous, granulomatous, etc. Some of the tumors are typical instances of tubular epithelioma. There is general agreement as to the obvious fact that the morbid process in all the new-growths is practically an epitheliomatosis, a fact strongly emphasized when Quinquaud demonstrated the nature of his classical cases before the International Congress in Paris, in the year 1889.

Diagnosis.—Xeroderma pigmentosum is so pronounced in its features that it is seldom an error is made in its recognition. The early date of its onset for the most of cases, the combination of pigmentation, telangiectasis, atrophic patches, and the development in the child's skin of warty growths, are all significant. The pigmented, atrophic, and occasionally vascularized tissue of scleroderma might possibly be mistaken for the disease under consideration but the leather-like condition of the integument in scleroderma, its pigmentation in irregular areas (rather than in macular lesions suggesting freckles), its limitation to definite areas other than those exposed to the light, and in the circumscribed types its frequent development in the regions supplied by cutaneous nerves—all these are significant.

Treatment.—Up to the present time, treatment of the disease has proved unavailing. Internally, cod-liver oil, tonics, the salts of iodine, and arsenic have all been employed. Crocker lays stress upon active and prompt surgical treatment of the ocular lesions and epitheliomatous growths after their development either as tumors or ulcers.

Little stress has been laid upon the hygienic management of these cases, which we have found of high value. Our patients improved greatly under hospital care. We employed the x-ray with excellent results in the treatment of several of the epitheliomatous ulcers, which speedily went on to repair under the influence of the ray. Sichel,¹ and Balzer and Merle² had a similar experience. At the same time, seeing that in cases radiotherapy has produced both pigmentation, telangiectasis, and atrophy, it would appear on *a priori* grounds an inexpedient method for adoption in these conditions.

Hahn and Weick,³ experimented upon two cases with different forms of light treatment including Finsen's rays, the Uviol, and the quartz lamp. The results did not seem to be conclusive.

Prognosis.—The outlook for the majority of cases is exceedingly grave, most patients eventually perishing from the immediate or remote results of cancerous changes. Two of Crocker's patients lived for nineteen years; another (supposed "senile" case) suffered for forty years. Precocity in wart- and tumor-development is said not to indicate special gravity for the future.

¹ Guy's Hospital Gaz. Mar., xxiv., p. 114.

² Annales, 1906, s. iv., vii., p. 1054.

³ Archiv, 1907, lxxxvii., pp. 371-398.

RHINOSCLEROMA.¹(Gr., *ῥίς*, or *ῥίν*, the nose, and *σκληρός*, hard.)

Symptoms.—A knowledge of this rare disease, first described by Hebra and Kaposi in 1870, has been obtained from a study of some one hundred cases observed by these and other authors. The following is a concise description of the malady as thus presented.

The disease commonly begins in the septum or a single ala of the nose, without inflammatory symptoms. The involved parts slowly enlarge, and become finally as dense as ivory. The individual lesions are flat patches, or elevated and circumscribed nodules, papules, and tubercles, painful upon pressure, movable to a certain extent over underlying tissues, and covered either by a normal integument, or by a light- or dark-red, shining, vascular epidermis. Neither hairs nor glands are discernible over the lesions. As the disease progresses the alæ become enlarged, flattened, and so indurated that they cannot be pressed together, while respiration may be impeded by stenosis of the nares. The process may extend to the neighboring parts, involving thus the upper and lower lips, gums, velum, epiglottis, larynx, trachea and jaws, the teeth meanwhile falling from their sockets and the soft palate becoming in some cases perforated. Involution of the process has not been observed, and the lesions do not degenerate by ulceration. Max Zeissl,² however, reports a case in which there was ulcerative destruction of the entire left nostril, as well as of the tip and right ala of the nose. Occasionally superficial excoriations have occurred, but very rarely a diminution in the consistency of the mass. The disease pursues a chronic course, requiring years for its development; and though the affected parts are painful on pressure they are otherwise not the seat of subjective sensation.

Etiology and Pathology.—The disease is observed between the fifteenth and fortieth years in persons of all social conditions and in individuals of both sexes, free from syphilitic, tubercular, and other cachexias.

Kaposi originally observed, as anatomical lesions of the disease, a dense infiltration of the corium and its papillary layers with small closely packed elements, which he recognized as a true new-formation. He considered this as analogous to small-cell sarcoma, inasmuch as Mikulicz, Geber, and Billroth had seen some of the elements of the neoplasm undergoing the osseous transformation common in sarcomatous tumors.

In 1882 A. von Frisch, after examining tissue removed from lesions of rhinoscleroma in twelve patients, found in the cells and between them in the interpapillary fissures of the connective tissue bacteria, distinctly rod-shaped, one and one-half times longer than broad. These bacilli were successfully cultivated, and though exper-

¹ For bibliography see Marschalko, *Archiv*, 1900, liii., p. 163, and liv., p. 235 (a histological and bacteriological study of two cases with full review of subject); and Castex, *La Pratique Dermatologique*, t. iv., p. 187.

² *Wien. med. Wehnschrift*, 1880, p. 621.

imental inoculations with culture-fluids thus obtained were negative in results, the organism of Frisch has been considered to be the cause of rhinoscleroma.

The bacilli are found encapsulated in a colloid-like substance and in series of twos and fours. They occur chiefly in certain large bladder-like cells which are characteristic of the disease, and which are known as *Mikulicz cells*. They are found also in plasma cells, in the interepithelial spaces, and in the lymph channels. Metastases have been recognized in neighboring glands. Two forms of cells have been distinguished by Mibelli, one a dropsical and another a colloid. Both have been regarded as products of degeneration from the toxins of the organism, but it is possible that the former, which corresponds to the Mikulicz cell, owes its peculiar character to the presence of zoöglea, a mucoid substance produced by the bacilli which have invaded the cell. Pawlowsky, of Kieff, in 1890, demonstrated that the bacilli of the disease are pathogenic for the lower animals.

Dreschfield¹ found in sections of tissue obtained from a patient of Payne's numerous bacilli less slender and smaller than those occurring in tuberculosis and with slightly thickened extremities. These were unlike those exhibited at the Berlin Congress by Paltauf, who considers them closely related to Friedländer's pneumococcus.

While Barduzzi, Pellizari, Cornil, Alvarez, Lustgarten, and others have contributed to the evidence in favor of the parasitic nature of the disease, Besnier and Doyon, however, pointing to the limitation of the disease to Austria, reject a parasitic origin. Against the specificity of the bacillus of Frisch is argued the difficulty of distinguishing that organism from the pneumococcus and other forms which might conceivably penetrate the tissues from the nasal cavity; the uniform failure to produce the disease by inoculation in man; the absence of contact-infections though the nasal discharge of the victim be loaded with bacilli; and the fact that it is endemic in a relatively limited area. Rogers² calls attention to the fact that no other member of the group to which the bacillus of Frisch is shown to belong by cultural characters is known to produce lesions of productive type; they are all invariably pyogenic; therefore if it is the cause of rhinoscleroma, it is in every way an exception to its group.

Diagnosis.—The disease can hardly be mistaken for another in consequence of its situation, the disfigurement it occasions, the ivory-like elasticity and induration of the affected parts, and the rarity of ulcerative degeneration. As distinguished from syphilis, it is known to be unaffected by specific medication. Since rhinoscleroma, however, has been by some writers assumed to be a form of syphilis, it is needful to distinguish clearly between the two. But as in the former affection there is rarely softening of the ivory-like induration, much less ulceration, which is common in syphilitic gummata, the distinction is tolerably clear. From the variety of acne rosacea of the nose

¹ Brit. Med. Jour., 1885, ii., p. 837.

² Jour. Infect. Dis., 1907, iv., p. 51.

known as rhinophyma, rhinoscleroma is readily differentiated by the softness and compressibility of the acneiform affection and its evident vascular and glandular composition. (*Cf.* Chapter on Gangosa.)

The ulcerations of epithelioma have a more circular outline, a more elevated edge, and occur in persons of a more advanced age. Keloid, if found in the situation of rhinoscleroma, does not ulcerate.

Treatment.—The method of relief thus far employed is a total or partial extirpation of the neoplasm. Kaposi speaks of dilatation of the nares, where there is actual or threatened nasal occlusion, by means of laminaria and compressed sponge. Both excision by the knife and destruction by caustics have been found to secure merely temporary benefit, as the growth is reproduced with rapidity.

Prognosis.—The future of the patient is grave. The disease not only persists and recurs after operative interference, but also may endanger life by obstruction of the nostrils. Zeissl's case proved fatal ten years after the disease first appeared.

TUBERCULOSIS CUTIS.

Tuberculosis is one of the most common, formidable, and destructive of the great scourges of the human family. It may attack either primarily or secondarily any organ or tissue of the body. The skin is not rarely the seat of its ravages, and when extensively involved the results are in the highest degree disfiguring and repulsive.

The consequences of tuberculous invasion of the skin are usually declared early in life, because in those periods the skin is most easily invaded, and also because at these ages the habits and environment of the individual are conducive to the occurrence of the accident. Tuberculosis of the skin may be the result of general infection of the body; or may, on the other hand, be the starting-point of such infection. In either event the disease is always originally acquired by infection and not by inheritance. Children are rarely, if ever, born tuberculous. The coincidence of several members of one family exhibiting evidences of the disease is most readily explicable by the opportunities for infective accidents furnished in such families.

In the pages which follow no attempt is made to revert to the remarkable and instructive history of the gradual acquisitions of science on the subject of this disease. Neither within these limits is it desirable to indicate the several conditions which in their relations to this subject have been confused in the past, and the names of which have served as titles for chapters on cutaneous disorders. It will be sufficient if the results obtained from the vast and valuable labors of the pathologists and clinicians of the last decade be concisely set forth with a view to the simplest systematic conception of the subject.¹

¹In the preparation of this chapter valuable aid has been rendered by the symposium on the subject prepared at the request of the Council of the American Dermatological Association, by James C. White, of Boston; John T. Bowen, of Boston; and George Henry Fox, of New York. Boston, 1892.

The generally recognized clinical forms of cutaneous tuberculosis are: (1) lupus vulgaris; (2) tuberculosis verrucosa; (3) tuberculosis cutis orificialis; (4) scrofuloderma.¹

LUPUS VULGARIS.

(Lat., *lupus*, a wolf.)

The symptoms of lupus vulgaris are both numerous and diverse, a fact which may account for the many names which have been applied to its different manifestations, and which with few exceptions are descriptive merely of certain external features.

The lupous infiltrate may be limited to small areas or diffused over an entire region of the body. It may be first apparent in pin-head- to bean-sized flattened maculations (*Lupus Maculosus*, *Lupus Planus*), from which later may be developed papules, tubercles, or nodules of equal or somewhat greater size, rising above the general

FIG. 110.



Lupus vulgaris.

level of the skin and often perceptible within its mass by palpation (*Lupus Nodosus*; *Lupus Tuberculatus*, *Elevatus*, *Tumidus*, *Non-exedens*, *Non-ulcerosus*).

¹ Erythema induratum is added to this group as it is accepted by the majority of observers to be a manifestation of tuberculosis of the skin. A group of diseases probably due to the toxins of the bacillus of tuberculosis are described in a subsequent section. Lichen scrofulosorum is placed in the latter group, though by several investigators it is believed to be a true tuberculosis of the skin, yet strong evidence can be brought forward to prove its toxic rather than local bacillary origin.

As in syphilis in the course of which, though almost every one of the elementary lesions of the skin may be developed, there is a distinct predominance of the papule and tubercle, so in lupus vulgaris the type of the disorder is shown in the lupous nodule, the "lupoma," as it is designated by some authors.

A typical patch of lupus vulgaris of small size is dull-reddish or purplish in color, scale covered, moderately elevated and well-defined. It is of a softish, almost boggy consistency, yielding when pressed upon firmly with a blunt-pointed probe and readily penetrated by a

FIG. 111.



Lupus vulgaris.

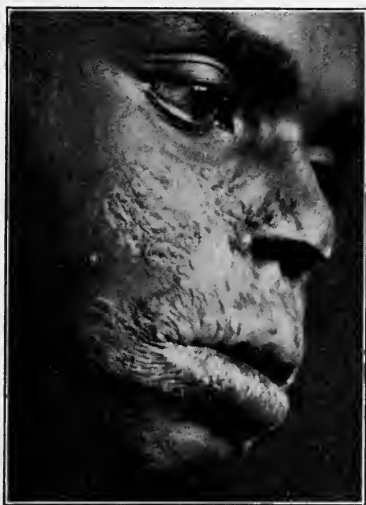
sharper instrument. Under the dioscope the inherent brown color of the individual nodules of which the patch is composed is revealed. It may remain thus for many years without change, except a gradual increase in size.

The changes within, about, and beneath these lesions furnish practically the clinical pictures of lupus vulgaris. Thus there may be extensive œdema, thickening, hypertrophy, hyperplasia (*bouffissure*), pachydermia, even telangiectasis, and an accompanying lymphangitis or lymphadenitis (*Lupus Hypertrophicus*, *Papillosus*, *Œdematosus*, *Elephantiaticus*, *Tumidus*, *Exuberans*, etc.). In many of these cases the prominent symptom which has suggested these names to the older writers is in fact a simple inflammatory swelling, due only indirectly to the lupoid involvement of the skin, a fact which can be recognized after any efficient treatment of an extensive plaque of lupus of the

face, the subsidence of the swelling being one of the most conspicuous of the immediate results of the treatment.

Involution of the lupoma, or of tissue infiltrated with lupoid cells, occurs by resorption of that material, by fibroid metamorphosis, and by ulceration. These several changes separately or together furnish other clinical pictures of the disease. Thus the lupus-lesion or patch

FIG. 112.



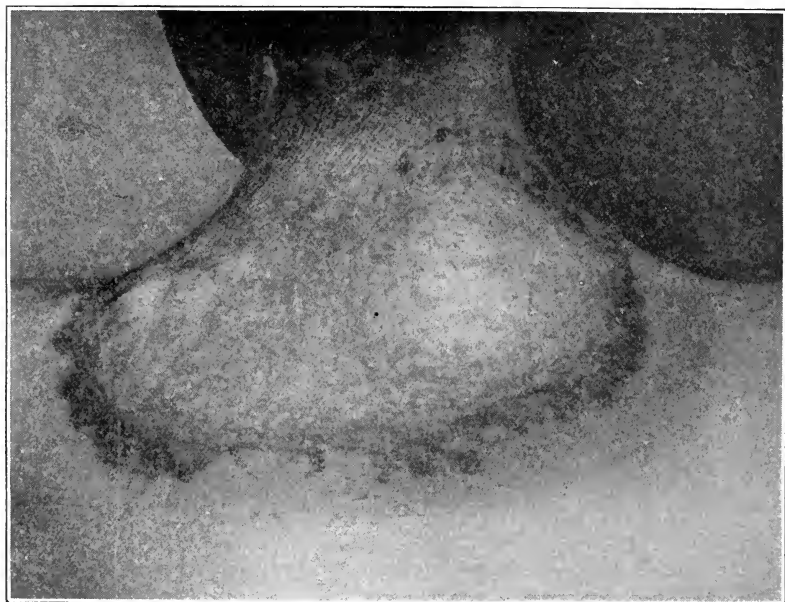
Lupus vulgaris in a colored patient.

may furnish scales, whitish, dirty, yellowish brown, or even glistening, the epidermis above and about becoming wrinkled. This process may be central or peripheral as respects patch or lesion, leaving eventually a cicatriform depression in the skin (*Lupus Exfoliativus*, *Lupus Psoriasiforme*, "*Lupus-psoriasis*"). When a fibrous metamorphosis occurs a sclerotic mass occupies the site of the former lupoid tissue, which in some cases progresses to extension of the lupoid patch in consequence of the further production of the toxins of the bacilli in the site affected; and in others produces cicatriform tissue resembling that left after involution without ulceration of the gumma of syphilis (*Lupus Sclerosus*, *Scléreux*, *Fibrosus*).

In the degenerating forms of lupus, ulceration may begin by breaking down the epidermis over the lupous tissue or by a more or less rapid transformation of patch or lesions into a cheesy semi-purulent mass of detritus. When pus is freely formed, whether superficially or deeply, crusting ensues, the débris of epidermis being entangled with the desiccated secretions. These crusts are variously colored, and differ in thickness with the severity of the degenerating process beneath. The oval or circular ulcers which furnish them are usually well defined, though irregular as to the margin, shallow, thin-edged, and flattish; and their floors are dirty-reddish or purplish,

indolently granulating, furrowed, hemorrhagic, or, when cicatrization is in progress, healthy. The destruction produced by involution of a lupous patch may be both by resorption and ulceration in the same subject and at the same time. The two processes may also coincide with an outbreak of fresh lupous tubercles, which later may develop at one point or another of the patch undergoing involution, probably from emigration of bacilli at the point of advance. In other cases lupus may spread by the formation of fresh nodules and plaques separated by islets of sound skin from those previously degenerated. When the ulceration advances it may be superficial, deep, or have

FIG. 113.



Lupus vulgaris serpiginosus.

other peculiarities, and be subject to other accidents of the ordinary process of ulceration whence the names *Lupus Serpiginosus*, *Profundus*, *Superficialis*, *Gangrænosus*, *Exulcerans*, *Rodens*, etc. *Lupus Crustosus* and *Rupioides* are terms descriptive merely of the incrustations which form in some cases. Exuberant granulations elevating the floor of the ulcer may produce the condition termed *Lupus Fungosus*, *Lupus Fungoides*, *Lupus Vegetans*. *Lupus Keloides* indicates a cicatricial overgrowth of the scar-tissue left after any one of the several conditions described above.

One of the most conspicuous features of lupus vulgaris is its essentially chronic course. It requires far more time for its complete evolution than either syphilis or carcinoma; and in this point is best compared with lepra. For a quarter of a century a lupus-patch may be limited to a space no larger than the palm of the hand, and exhibit some evidence of activity during the greater part of that period.



PLATE XXXII

FIG. 1



Lupus Hypertrophicus.

FIG. 2



Lupus Vulgaris of the Leg.

Lupus of the Face.—Here the first manifestation is the so-called primary efflorescence, exhibited on one or both cheeks, nose, or cheek and nose, as a dull-colored maculation or minute nodule, often long unnoticed, or as a finger-nail-sized, purplish thickening of the skin. Extension may then occur by multiplication of the lesions, or by spreading of the single patch, the central parts wasting or cicatrizing. The contracture of the irregular scars thus resulting may produce an ectropion of the lid or lip, and with this is often seen the “bouffissure” of the features already described. Crusting and ulceration may be conspicuous or well-nigh absent features. Gradually the subcutaneous tissues become involved.

The nose, after absorption of the lupous tissue, may become shrunk and retracted to a miniature of its former dimensions, its tip being noticeably reduced to a sharp point, producing thus a characteristic deformity suggesting the beak of a parrot. In other cases the point becomes bulbous, flattened, livid, and knobbed, with a thickened septum and distorted alæ, an isolated patch or two of lupous infiltration showing in the neighborhood of the cheek on one or both sides. The last described condition may lead by degenerative processes to the first, but is more commonly noticed as a less severe and more localized involvement of the face, which may terminate, in favorable cases, without the severe mutilation first described.

The subcutaneous tissue, mucous membrane, cartilages, and bones may be destroyed; and in place of the nasal organ itself there may be left eventually two ovoid cavities in the face, separated merely by the posterior flange of the septum.

Often large portions of the skin of the head (cheeks, lips, nose, eyelids, chin, ears, brow, and neck) become altered by the lupous growth. The resulting thickening produces a marked and characteristic deformity, reducing the openings of the mouth and lids to narrow slits, interfering with vision, speech, and mastication, and producing a marasmus from these causes alone, before there is ulceration at any point.

The ravages of the disease are at times frightful in severity; not merely in consequence of the destructive ulceration to which it tends, but from the deformity left by awkward attempts at repair. The entire surface of the head may be thus converted into a hideous travesty of humanity, while yet its possessor is left with all vital organs and functions apparently unimpaired.

The upper lip, when involved, becomes first swollen, fissured, hemorrhagic, and crusted; and a granulating surface indicates extension of the disease to the adjacent mucous surface. Later, if the ulcer heal, the mouth, by contracture, is reduced to a repulsive-looking slit or chasm in the face, permanently retracted, and either open or closed. The gums, lining membrane of the lips, velum, and hard palate may also be granulating, eroded, or whitish, when the exfoliated epithelium is *in situ*. Ulceration and cicatrization here also produce deformities interfering with the function of the parts,

aphonia, for example, resulting from the operation of these causes in the larynx.

Lupus of the Ears may be symmetrical in development, or affect but one auricle. As in eczema, a favorite point of election is the lobule, which, with or without tumefaction of the whole organ, becomes a pyriform, purplish, dependent tumor, agglutinated speedily to the cheek. Later, when ulceration occurs, the auricle may disappear or be reduced to a shrunken shell of its former state, the external auditory meatus being, by the same process, occluded.

Lupus of the Trunk is, as a rule, more extensive and less destructive than lupus of other parts. Giant areas over the loins, hips, and belly may be involved in superficial, serpiginous ulceration, the centre healing as the peripheral ring spreads. In these cases it is even more difficult than in others to insure cicatrization.

Lupus of the Genital Region may occur in both sexes, and then, as a rule, has extended thither from affected areas of the adjacent integument. It is one of the rarest of the locations involved.

Esthiomène (so-called "Lupus of the External Genital Organs of Women").—In the year 1849 Huguier published a report of cases under the title of esthiomène, which have been the basis of a conception widely prevalent since that date that lupus of the vulva presents certain peculiarities not displayed by the same disease elsewhere. The subject has been restudied with special care by several observers, including myself,¹ and by Taylor,² of New York. Lupus is among the exceedingly rare affections of the external genitalia of women, and where existing does not in any special way differ from its manifestations in other regions of the body. The "esthiomène" of Huguier and his followers is a complexus of differing disorders, including cases of syphilitic sclerosis, secondary lesions, and gummata; and hypertrophies of the genital organs due to chronic "chaneroid," traumatism, and inflammations of a simple character aggravated by filth. It is not known to be a tuberculosis of the vulva, though it is possible that some tuberculoses may have been included in the category.

Lupus of the Extremities is remarkable for its interference with the mobility of the smaller bones of the hands and feet, as a result of rigid cicatrices, and also for the production of caries and osseous necrosis. Mutilating effects are thus produced by loss of phalanges, and also by shortening of the hand or foot after the destruction of bone. Elephantiasic enlargement of such organs as the hands and feet thus corresponds to the livid tumefaction seen occasionally in the face. Thickenings, ridges, knobs, nodules, warty excrescences, ulcers, crusts, and callosities are often commingled, and in patients of mature years strongly resemble some forms of vegetating and ulcerating epithelioma.

Lupus of the Mucous Membranes may or may not mean extension of the disease from an affected adjacent integument. The lupous

¹ J. of C. and G. U. D., 1889, vii., p. 129.

² Ibid., 1891, ix., p. 201.

nodule, in consequence of warmth and moisture, is here transformed into a moist papillary outgrowth, or externally granulating patch which may ulcerate and cicatrize. The borders of such an affected area are well defined, and its surface is reddish and florid, quite pallid, white and glistening, or of a dirty grayish-white color where the investing epithelium is loosened but not yet detached.

The soft is more often involved than the hard palate, but these parts with the tongue, larynx (epiglottis, interarytenoid fold), and gums may be extensively invaded. Often for from two to five years the disorder may make no apparent advance, being limited to patches of red, swollen, coarsely granulating, whitish or glistening mucous membrane, with ulcerating and cicatricial processes slowly resulting. The lymphatic glands beneath the jaw and in the subclavian region may be simultaneously enlarged. In connection with the characteristic lupoid nodules grayish growths of the character of small tumors may be recognized in the larynx, with the result of partial occlusion of the rima glottidis. Patients may suffer from apical pulmonary tuberculosis, presumed to be the result of extension of the disease from laryngeal lupus.

“**Lupus Démisécléreux de la Langue.**”—Leloir¹ pictures and describes the features in the case of a girl fifteen years of age, with lymphatic adenopathy, typical lupoid nodules about the nose, and characteristic “parrot’s beak deformity” of the latter. The middle of the dorsal surface of the tongue displayed smooth, pea-sized and larger sclerotic nodules, grayish yellow, firm and softish, separated by furrows, and non-ulcerative. The palate, uvula, and larynx were involved. Tubercle-bacilli were recognized and cultivated in series, and inoculation of the cultures produced tuberculosis in guinea-pigs and a rabbit.

TUBERCULOSIS CUTIS VERRUCOSA.

There are several forms of tuberculosis of the skin in which lesions differing both in appearance and career from those described in connection with lupus vulgaris have been demonstrated to be the result of the encroachment of bacilli of tuberculosis upon the integument. The lesions exhibit for the most part a verrucous or warty appearance, and are illustrated well in the most distinctive clinical member of the group, the anatomical tubercle. In 1884 bacilli first were discovered in its mass, and in the year 1886 Riehl and Paltauf pointed out the connection of this lesion with cutaneous tuberculosis.

Verruca Necrogenica (*Post-mortem Tubercle, Dissection-tubercle, Anatomical Tubercle*).—Verruca necrogenica is a vesiculo-pustular or wart-like lesion of cutaneous tuberculosis, situated usually on the hands, and resulting, for the most part, from contact with bodies of the dead.

This lesion was named verruca necrogenica first by Wilks.² It

¹ Internat. Atlas, 1889.

² Guy’s Hospital Reports, s. 3, viii., p. 263.

occurs on the fingers (especially on the dorsum of the thumb and of the index finger) of those engaged in the habitual handling or dissection of cadavers, and results from such professional contacts, from dissection-wounds, and from all accidental inoculations with tuberculous virus. Cases are reported in which the lesion has had a non-cadaveric origin. It begins at the site of an abrasion or wound as a vesico-pustule, with deep-seated base and reddish or reddish-purple areola. This is productive of a burning, smarting, or pruritic sensation. The lesion accomplishes a period of bursting and crusting, which may be followed by complete involution. Several isolated or grouped papules, nodules, or tubercles may be formed, one or a patch of several being subsequently covered with villosities or undergoing atrophic changes over an area several inches in diameter. Dermatitis and suppuration, very rarely ulceration, may complicate the process, though at times the first symptom of infection is an ulcer forming at the site of a cicatrix. The typical so-called "anatomical tubercle" is indurated and horny. A pigmented verrucous papule or tubercle very slowly forms, which may become fissured at one or more points.

FIG. 114.



Tuberculosis verrucosa cutis.

The characteristic lesion is the thickened, indolent, more or less pigmented and fissured, split-pea to bean-sized wart, usually single, found on the finger of the anatomist. This may persist as an apparently innocuous lesion for months or years, or suddenly assume a formidable aspect.

In other cases grave symptoms result, either in the involvement of the deeper tissues (subcutaneous, thecal, tendinous, periosteal), or in

the production of erysipelas, pyæmia, septicæmia, or gangrene. Surgeons divide these cases into mild and acute varieties, according to the symptoms exhibited. The records of the medical profession in almost every one of the large cities of every country contain the names of one or more eminent men whose lives have been sacrificed in this manner. In a few instances the local process has been followed by generalized tuberculosis.

Tuberculosis Verrucosa Cutis (Riehl and Paltauf) (*Lupus Sclerosus*, *Lupus Verrucosus*, *Scrofuloderma Verrucosum*; *Fr.*, *Lupus Papillaire Verruqueux*; *Lupus Scléreux*).—The lesions of this form of cutaneous tuberculosis occur often on the flexor aspect of the lower forearm, but also in other regions of the body, such as the integument covering the inner malleolus and the backs of the hands. The plaques are insensitive, brownish red, movable, small-coin- to palm-sized, single or multiple, distinctly circumscribed, ovoid or scalloped in outline, and usually covered with minute pustules, fine pointed vegetations, and thin crusts. A characteristic violaceous halo commonly surrounds the whole. When healing occurs a smooth and scaling scar results. In those cases the papillary layer of the skin is chiefly involved.

In the papillary layer of the corium the inflammation results in the production of numerous minute abscesses. Caseating nodules containing tubercle-bacilli, giant-cells, and epithelioid cells are commingled with the abscesses. In some cases tubercle-bacilli are numerous; in others their detection is difficult if not impossible, as in *verruca necrogenica*.

The disease is to be most carefully distinguished from cutaneous blastomycosis, the lesions of which it closely resembles. Here a histological examination is essential.

The disorder is said to be especially frequent of occurrence in those handling the dead or living bodies of animals.

Other Verrucous Tuberculoses.—An interesting series of morbid phenomena is presented when, for special reasons (proximity of tuberculosis of organs other than the skin, accidents of position and exposure, influences that escape detection), sites of tuberculous infection, whether primary or secondary in order, exhibit peculiar special symptoms:

TUBERCULOSIS PAPILLOMATOSA CUTIS (Morrow's type) is by some authors assigned to verrucous tuberculosis. In these cases exuberant, soft, and florid excrescences rise to the height of one or two centimetres above the general level, closely packed together, with individual elements separated by deep fissures, the whole bathed in a puriform mucus concreting in dark crusts.

FIBROMATOSIS TUBERCULOSA CUTIS (Riehl).—In these cases there is not merely a papillomatous, but often a sclerotic growth found on the lips, nose, cheek, or about the anus or other mucous outlets of the body, interspersed with verrucous lesions, vegetations, and small shallow ulcers. The tuberculous masses may be in the form of tumor-like bodies or thickenings of the subcutaneous tissue.

ELEPHANTIASIS TUBERCULOSA CUTIS is a term applied to gigantic overgrowths of the integument complicated by lymphatic occlusion. In these cases there has usually been a blocking of the lymph-channels by an infarction produced by leucocytes charged with tubercle-bacilli.

It is chiefly important to note in this connection that accidental inoculations with tuberculous material produce in different cases different clinical results, the essential part of the process being the transference of tubercle-bacilli. These infections are far more common than is generally understood. They occur in both the young and the old. Fox, of London, has reported such instances at the ages of seventy-two and eighty-two, respectively; and Marmaduke Shield has seen cases of general tuberculosis of the aged, resulting from these accidents.

TUBERCULOSIS CUTIS ORIFICIALIS.

The clinical forms included under this title are those once supposed to be the sole manifestations of cutaneous tuberculosis. The title "tuberculosis of the skin" was, in fact, applied exclusively by many writers to the lesions observed by Kaposi, Jarisch, Chiari,¹ and others. These were indolent, oval or circular, shallow, discrete, reddish-yellow, granulating ulcers, often covered with thin crusts, occurring about the mucous orifices of patients affected with pulmonary tuberculosis (lips, anus, and vulva) and with development of miliary tubercles in the adjacent mucous tract. Tuberculous lesions of ulcerative type on the alæ of the nose, over the lips, and about the ears, have been recognized in association with laryngeal, palatal, oral, pulmonary, and intestinal tuberculosis.

In the case of a patient in advanced pulmonary tuberculosis, lately seen by us, there was a tuberculous ulcer near the anus, and also a well-defined patch of infiltration in near proximity, highly suggestive of some of the forms of lupus.

Acute Tuberculosis of the Skin has been described under different titles (*dermatitis tuberculosa acuta*,² *tuberculose pseudoulcéreuse*) by Heller and Gaucher. In the case of children macules, vesicles, bullæ, papules, and pustules, terminating in deep, crusted, circinate ulcers, accompanied by caseation of neighboring glands, were found to contain bacilli; and inoculations of cultures resulted in distinct tuberculous infection. These cases scarcely justify their separate classification. They are properly placed with the clinical forms of disease termed, for provisional purposes, scrofulosis of the skin.

Exanthematic Miliary Tuberculosis of the Skin may follow the exanthematous fevers in children. The lesions are multiple, indolent, dull brownish-red tubercles, acuminate, situated in or near the cutan-

¹ Vierteljahr., 1879, vi., p. 269.

² E. Brunsgaard, Archiv, 1903, lxxii., p. 227 (abstr. B. J. D., 1904, xvi., p. 151). A report of a case of almost universal dermatitis in a woman aged 63 years. General enlargement of the lymph glands was present. In both the glands and sections of the skin a tuberculous structure with tubercle bacilli was demonstrated.

eous follicles and suggesting the lesions of *acne papulosa*. When in process of degeneration they form rounded, circular, or polygonal, sharply cut ulcers having a violaceous border, an irregular, granular floor, and a scanty sero-purulent discharge. Miliary nodules are to be seen both on the floor of the ulcerative surface and in the periphery of the lesion. They contain tubercle-bacilli.

This disorder occurs, as a rule, in those exhibiting other and unmistakable symptoms of tuberculosis. If the lesions be solely cutaneous, healing may result.

SCROFULODERMA.

(Lat., *scrofa*, a sow.)

The term *scrofula*, or *struma*, has been long and loosely applied in general medicine for the purpose of designating a number of diseases the real significance of which was unknown, their points of resemblance being greatly outnumbered by their specific differences. The researches of the last twenty years have been steadily and continuously restricting this list in almost every department of medicine. Many of the disorders once supposed to be scrofulous are now known to be syphilitic. In orthopædic surgery a number of joint-affections once believed to be incontestably of strumous origin are known to be producible by traumatism exclusively. And in dermatology no less a broad advance has been made since the day when eczema, psoriasis, and acne were described as evidences of *scrofula*.

The term *scrofuloderma* is applied now only to those forms of cutaneous tuberculosis in which the skin is involved secondarily by direct extension of the process from tubercular glands, or other foci of tuberculosis beneath the skin. By the term *scrofula* Billroth recognized a condition in which there occurs at any point in the body where irritation has operated an indolent inflammation, which persists after such irritation has ceased, which frequently terminates in suppuration and caseation, and which subsequently rarely pursues a hyperplastic career. If with this be conjoined inflammation and caseous infiltration of the lymphatic ganglia, or of the subcutaneous connective tissue, amyloid degeneration of one or several of the viscera, tumefaction of the belly, chronic keratitis, ophthalmia, otorrhœa, or coryza, a chronic arthritis (white swelling), a pasty, dirty colored and thick or delicate and transparent skin, exhibiting cicatrices of old abscesses or ulcers, and a voluminous nose overlooking thick, everted lips, the general picture of the scrofulous patient may be considered complete. The recognition by Robert Koch of the etiological importance of the bacillus tuberculosis in tuberculous disease, and the demonstration of the presence of these micro-organisms in a number of lesions heretofore regarded as "scrofulous," have established their scientific position beyond controversy.

The *scrofulodermata* are characterized by the occurrence of pathological processes in the skin, lymph-glands, or periglandular tissues, which betray evidence of the tuberculous process. They usually be-

gin as firm, well-defined subcutaneous nodules, similar in type to the syphilitic gumma, which gradually enlarge, become attached to the skin, subsequently degenerate, exhibit characteristic ulcers, and usually terminate by no less characteristic cicatrices ("Gommes Scroful-euses," "Gommes Scrofulo-tuberculeuses," "Scrofuloma," Cold Abscess of the Skin).

The typical and commonest form of scrofuloderma is encountered about the face and neck, where the lymphatic glands have long been tumid, and are either dense or doughy to the touch. Usually this condition is reached very slowly; often months and years are required for its production. The glands may be as small as almonds or as

FIG. 115.



Scrofuloderma.

large as the closed fist. Gradually a characteristic dermatitis ensues in the skin which is superimposed. It becomes purplish and thinned, and finally yields, giving exit to a sero-purulent fluid mingled with caseous matter and blood. The pus-corpuscles of this fluid examined under the microscope are seen to be poor in protoplasm. Fistulous tracts and sinuses result, which undermine and perforate the skin, resulting in the production of a chronic discharge and characteristic ulcers. The latter are far more remarkable for their borders and bases than for their floors. They are usually linear, occasionally elongated and oval, almost never circular. As a result, their uneven floors, covered with pallid granulations and a watery pus, often are hidden beneath their inverted, tumid, and uncolored edges;

or the latter may be thinned, stretched over a fistulous pocket, and reddish or purplish in color. Their bases usually are attached deeply to the subcutaneous tissue, and are firm or soft, never densely indurated. The resulting crusts are thin, tenacious, reddish or brownish, and, like the ulcer, often linear, rarely bulky, never rupioid. The resulting cicatrices are corded, depressed in irregular lines or bands, and often alternate, with equally irregular nodules (scrofulous gummata) where the degenerative process either has been arrested or is still in activity.

Rarely enormous ulcers originate in the manner described above, which dissect out vast areas of subcutaneous and intramuscular tissue in the neck and even the extremities, in the course of which cartilage, bone, and periosteum are melted away. Usually but a few of these points of degeneration, from two to six, are exhibited in one patient.

Another type of scrofulous gumma of the skin begins as a subcutaneous nodule on the back or over the extremities of scrofulous children, the career of which is practically that outlined above. It differs chiefly from the lesion more or less directly connected with the lymphatic glands, by reason of its relation with lymphatic vessels distributed to a deeper and possibly distant tuberculous focus.

According to Unna, there is a "dry" form which originates in the action of tuberculous toxines in the granuloma; and a "wet" form, the product of reaction of the nutrient channels and the resulting œdema. Tubercle-bacilli have been recognized in a few cases only, but their toxines have given rise to the pathological changes.

Tuberculosis Fungosa Cutis¹ (Riehl).—A group of cases are recorded in which tumors resembling those seen in mycosis fungoides and sarcoma occurred intermingled with other lesions. Histologically and bacteriologically these have been proven to be tuberculous as the lesions are produced in the skin from infection with the tubercle bacillus by direct contiguity from an infected bone, muscle, or other structure beneath; they properly belong to the scrofulodermata. On account of its striking clinical aspects the disease is described separately. It is essentially an infiltrating form of cutaneous tuberculosis with excessive granulations forming fungous tumors and having in addition ulceration, crusts, and fistulous tracts in which cheesy degeneration is abundant.

Tuberculous Dactylitis, observed generally in children, is characterized by bulbous extremities of the fingers and toes, the skin covering the same being at times the seat of infiltration and thickening. White believes this process to be more common than that occurring in dactylitis syphilitica.

Suppurative Tubercular Lymphangiectasis (Hallopeau and Goupil) is a condition in which scrofulo-tuberculous gummata, in small-nut to egg-sized tumors, form along the lymph-vessels, of the lower extremity particularly. When such a tumor breaks down it furnishes

¹ Pick, J. C. D., 1904, xxii., p. 305. A review of other cases and report in full of two new ones.

the typical picture of the scrofulous ulcer, with its cheesy and watery pus, its thin edge, and its indolent career. In these rare cases bacilli have been recognized in the secretion.

Tuberculosis Cutis Serpiginosa Ulcerativa is a term relating to a rare group of lesions in which brownish-red nodules, pea- to bean-sized, degenerate in the course of weeks or months until there results a centrifugally spreading, ovoid or roundish, even horseshoe-shaped ulcer, grayish yellow in hue and overspread with smaller cicatrices. Instead of nodules, the first lesions may be circumscribed areas of infiltration. The involved surface may be extensive, even larger than the two palms, and may coexist with secondary foci of involvement. Visceral and pulmonary tuberculosis may result. The resemblance of the large spreading patches to a serpiginous syphiloderm is striking.

Lymphangitis Tuberculosa Cutanea (Besnier, Lejars).—The lymphatic vessels of the skin may be either primarily or secondarily invaded with tubercle-bacilli, and in either event linear lesions form corresponding to the lymphatic trunks, or there develop tuberculous nodules or warts, dermic or subcutaneous in situation, which eventually ulcerate and discharge pus, blood, or lymph. At times a reticular network results, with fistulous sinuses. Several of the lymphangiectases have been demonstrated to be tuberculous in character.

Etiology of Tuberculosis Cutis.—Accidental inoculation of tuberculosis may occur at all ages and in all sexes, the infective material gaining access to the economy in the large number of instances by the medium of the lymphatics. There is, however, ampler opportunity for such transmission among the members of any family in which pulmonary tuberculosis exists; hence the widespread belief in the heredity of the disease. Attention has, however, been already directed in these pages to the striking fact that children are rarely born into the world tuberculous; and to the possibility that all cases of reputed inherited tuberculosis were acquired by direct infection.

Given, however, an infective micro-organism, the soil upon which it may flourish most favorably is of paramount interest in an etiological view. The young, the delicate, the cachectic furnish such a culture-field. With these must be included, as favoring such accidents, the mode of life of the very poor, the filthy, and the degraded. Thus, lupus vulgaris is originally developed in the majority of all cases during the first decade, between the third and sixth years of life; rarely after the thirtieth year, for the reasons above given. The significant fact in this connection is that at this period of life the child often deprived of the constant care of the mother by the demands made by a still younger infant, untaught in the simplest rules of cleanliness, picking and scratching the face after miscellaneous contacts of the fingers with all sorts of material, is exceedingly liable to inoculate the skin of the face with tuberculous virus, if there be victims of such disease occupying the same apartment or house. It is significantly first upon the face in these early years, and next over

parts such as the extremities or the genital region, to which the exposed hands have been carried, that the early symptoms of lupus vulgaris are betrayed. Further, it is noteworthy that well-marked cases are more frequent among the poor, the filthy, and the degraded than among the comfortable and cleanly. The prevalence of the disease in public as contrasted with private practice is conspicuous in all statistics.

As throwing additional light upon the question of childhood-infection, it is to be noted that other forms of tuberculosis occur at any period of life and in both sexes, when the accident of infection operates. Besnier, Little, and others, for example, report cases of lupus resulting from tuberculous infection in vaccination; Fournier, an instance in which a young woman was infected during the piercing of the ear for the insertion of earrings; Jadassohn, a case in which the tuberculous virus was inserted by tattooing; and Strauss, the history of a student who was wounded by a rapier in a duel, and as a result developed lupus in the site of the wound; Brums, an instance of infection by inoculation with a hypodermic syringe used for injecting morphine. In verruca necrogenica and warty growths of the same nature it is contact with the bodies of the dead or with tuberculous matter in any form that determines the result. The aged with tuberculous lesions upon the backs of the hands, middle-aged persons with other evidences of cutaneous affection, actually suffer from generalized tuberculosis as a result of the accident. All varieties are due to the local action of tubercle-bacilli. Tuberculosis verrucosa cutis results in the majority of cases from direct inoculation from external objects containing tubercle-bacilli.¹ It is reported frequently among the miners from the district around Dortmund.² Lupus vulgaris also is produced in this way, but frequently the infection is brought to the skin through the lymphatics. In scrofuloderma the bacilli find their way to the skin by direct extension from beneath, while tuberculosis cutis orificialis is an example of auto-inoculation, and is usually secondary to visceral tuberculosis.

What may be said of the causes of lupus vulgaris relates also to scrofuloderma, which, while occurring in both sexes and at all ages, is more frequent in early life because of the susceptibility of the tissues at those periods.

The soil fittest for scrofulodermatous manifestation is that where well-known agents have been most efficiently at work. All causes which tend to impair the nutrition and vigor of the body are, to an extent at least, efficient in its development, including privation from sunlight, fresh air, wholesome food, exercise, and hygienic influences in general. It is common among prisoners, exiles, and in this coun-

¹ Lassar, *Derm. Zeitschr.*, 1903, x., p. 505 (abstr. B. J. D., 1904, xvi., 151). A report of two cases of tuberculosis verrucosa cutis in patients working with diseased cattle, the author concluding that these were examples of bovine tubercle bacilli inducing cutaneous tuberculosis in man.

² *Archiv*, 1904, lxx., p. 329 (abstr. B. J. D., 1904, xvi., p. 431). A report of 166 cases occurring between the years 1889 to 1903 by Fabry and Schulze.

try, among negroes and those of mixed blood. Consanguineous marriages are said to result often in strumous offspring. Lupus and other forms of cutaneous tuberculosis have frequently followed an attack of measles.¹ In many cases scrofuloderma is the sequence of other depressing medical diseases and surgical accidents. In certain instances especially where it is limited to the neck, and accompanied merely by a cervical or submaxillary adenopathy, scrofulosis is consistent with full vigor and nutrition of the body and all other evidences of sound health.

Pathology of Tuberculosis Cutis.—Lupus vulgaris, tuberculosis cutis verrucosa, and scrofuloderma, as well as tuberculosis cutis orificialis (the one form hitherto recognized as tuberculous) are due to infection with tubercle-bacilli, and are practically identical histologically with tuberculous lesions in other organs of the body. The discovery of bacilli in lupous tissue, first made by Koch, has since been verified by Doutrelepon, Weichselbaum, Meisels, Schuller, Lustig, and others. The striking resemblance first shown by Virchow between a caseous miliary tubercle and a lupous nodule had, even before Koch's discovery, pointed to an identity of origin. The result of inoculation of culture-fluids has given positive results. Lenz, Hüter, Schuller, ourselves, and others have produced tuberculosis by introducing in rabbits granulations taken from lupus and other varieties of cutaneous tuberculosis.

For a knowledge of the microscopic characters of cutaneous tuberculosis we are indebted largely to the Germans. Virchow, Auspitz, Billroth, Lang, Kaposi, Klebs, Stilling, and Thin have contributed amply to the subject.

The histological structure of the various forms of cutaneous tuberculosis varies in minor particulars, but in essential features sufficient uniformity exists to enable the observer to discern that each is due to a similar exciting cause. Each is produced by the local action of the tubercle bacillus, and presents a cellular new-growth, vascular changes ranging from slight proliferation in the coats of the vessels to their complete obliteration; and attenuation, hypertrophy, or complete destruction of the collagen. The sebaceous and sweat-glands, hair-follicles, and elastin all suffer alteration, even to destruction. The epidermal changes in all are secondary, and include acanthosis, hyperkeratosis, parakeratosis, scaling, and at times even complete destruction by ulceration. The tubercular nodule in the skin resembles that found in other organs, and consists, essentially, of one or more giant-cells immediately surrounded by a number of small, round cells, which have vesicular nuclei, and which are either mononuclear leucocytes or daughter plasma-cells (Unna). Interspersed among these may be a few multinuclear cells, and surrounding these is a zone of plasma- and connective-tissue cells. No vessels

¹ Adamson, H. T., B. J. D., 1904, xvi., pp. 366-376. A full discussion with analyses of 28 cases.

exist in the nodule, and the fibrous elements are either attenuated or completely absent. The nodule is surrounded in the nodular form of lupus by a collagenous capsule. In another variety no limiting capsule is present, and the cellular hyperplasia spreads along the lymph-spaces, producing an even, brownish discoloration of the skin, in which case giant-cells are not numerous.

Degeneration occurs in the nodule, as is shown by the cellular protoplasm becoming homogeneous and the nuclei incapable of absorbing stains normally. True cheesy degeneration seldom occurs in the skin, which fact might be accounted for by the relative scarcity of bacilli in most of these lesions.

The cellular hyperplasia is composed of giant-cells, which are large, oval, round, or irregularly shaped cells, containing as a rule many peripherally placed nuclei and having a homogeneous centre; plasma-cells, which vary in size, are usually oval or oblong in shape, possess a large amount of protoplasm, and present an eccentrically placed vesicular nucleus; and small round cells, usually described as mononuclear leukocytes or daughter plasma-cells (Unna), which contain nuclei similar to the plasma-cell. In addition, some mast-cells are present, and in these the nucleus is surrounded by granules of protoplasm, which are identified by stains having metachromatic properties. Multinuclear cells are also present, and a large number of ordinary connective-tissue cells. Tubercle-bacilli are found most abundantly in the acute miliary variety of cutaneous tuberculosis; fewest in lupus vulgaris, in the lesions of which they are often difficult to demonstrate. Giant-cells are most abundant in lupus vulgaris, while cheesy degeneration, common to internal tuberculosis, is more prevalent in the miliary variety. Bacilli may be found between the cells, but are found more often in giant-cells. Animal inoculations may be performed successfully in each variety, and they all react to tuberculin injections.

LUPUS VULGARIS occurs in two varieties, the nodular and the diffuse. In the former the tubercles above described are enclosed in a limiting capsule of collagen, while in the diffuse variety the infiltration spreads evenly along the lymph-spaces without interruption, producing a diffuse infiltration. There is a tendency for the granuloma to be replaced by connective tissue, which at times multiplies to an excessive degree, producing a condition of elephantiasis. As the cellular infiltration progresses the normal structures of the skin are atrophied or destroyed; collagen, sebaceous and sweat-glands, hair-follicles, and, finally, elastin all disappear. Proliferative changes may occur in the epidermis, in which marked down-growth (acanthosis) of the rete into the corium results, producing the papillomatous variety of lupus, while with increased cornification verrucous forms occur. Pressure from below may rupture the epidermis, permit pyogenic infection, and result in ulceration. Edema, with accompanying parakeratosis and scaling, may be present. All these epidermal changes are secondary, however, and are in themselves not tubercu-

lous, the principal and characteristic changes being found in the corium.

TUBERCULOSIS VERRUCOSA CUTIS is distinguished by having the tuberculous plasmoma located chiefly in the papillary layer of the corium. The usual structure of the tuberculous nodule may be demonstrated. Marked acanthosis and hyperkeratosis are also distinguishing features. Miliary abscesses, produced by pus-cocci, may be found both in and beneath the epidermis. Tubercle-bacilli are usually more numerous than in lupus vulgaris and find their entrance from without. Both histologically and clinically this variety of tuberculosis is nearly identical with some forms of lupus vulgaris, and now often is classified as a manifestation of lupus vulgaris.

TUBERCULOSIS CUTIS ORIFICIALIS.—In this variety both in the number of bacilli present and in the type of lesion, there is an analogy with miliary tubercle of other organs. Large numbers of typical, circumscribed nodules are found deep in the corium; bacilli are numerous and easily demonstrated; the degenerative processes go on rapidly, the tubercles breaking down and coalescing to form masses of softened necrotic tissue which soon break through the epidermis to form an ulcer. About the borders of such necrotic areas new nodules are constantly forming, and the whole process is rapid, as in acute tuberculosis of other tissues. Histologically it is composed of the usual tuberculous plasmoma, its distinguishing features being the presence of large numbers of bacilli and also typical cheesy degeneration, which is not found in the other varieties.

SCROFULODERMATA.—The scrofulodermata originate in the subcutaneous tissues and involve the skin secondarily. The lymphatic glands or the tissues about the glands or lymphatic vessels become the seat of the tuberculous process, which runs a subacute course. The glands or peri-glandular structures finally break down into softened necrotic masses. Such areas of necrosis may remain indolent and superficial, or, in case a gland is involved, may be deep and extend by burrowing prolongations even to the bone. Sooner or later the skin over these softened masses becomes involved in a subacute inflammatory process and gives way, producing the typical ulcer with soft, ragged, and often extensively undermined edges. Experimental inoculations and the presence of tubercle-bacilli have demonstrated these subcutaneous processes to be tuberculous. The number of bacilli present varies greatly, being much larger than in lupus, but much smaller than in the orificial forms of cutaneous tuberculosis. The relationship of the scrofulodermata to lupus is occasionally shown by the formation of typical lupous nodules near the border of these scrofulous ulcers, the result no doubt of inoculation of the skin with the discharge from the ulcer. The granuloma here consists of a diffuse plasma-cell infiltration with some giant-cells about the edges of the lesions.

Diagnosis of Tuberculosis Cutis.—Epithelioma, though rarely resembling lupus vulgaris, is more often designated by that than by

any other false title. Great confusion has arisen from the looseness with which several authors have furnished illustrations of "lupus exedens," which were really pictures of cancer. But the latter is rarely a disease of early life, and when of early occurrence may not persist to adult years; the reverse of which is true in the majority of all cases of lupus. The nodules of lupus are absent in epithelioma, and their evolution in the disease is slower, less painful, and, in earlier periods certainly, of deeper situation. The ulcer of epithelioma is more often defined and single; its edges whitish, indurated, and everted; its floor uneven and glazed; its secretion scanty and occasionally fetid; its base a mass of indurated tissue. Lupous ulcers are often ill defined and multiple; their edges soft and inconspicuous, neither everted nor undermined; their floors granulating and flattened; their secretion relatively profuse and generally odorless; their bases soft and pliable, though occasionally indurated.

Tubercular, serpiginous, and ulcerative lesions of syphilis often resemble certain forms of lupus. In any doubtful case a history of infection, of other types of cutaneous disease, of mucous patches, of adenopathy, of abortions in women, etc., should aid in the recognition of syphilis. The suspected lesions should be examined carefully for the purpose of distinguishing characteristic lupous nodules in the patch itself or in the periphery of any exfoliating area. In the case of an adult a history of long-existing lupus may often be obtained; and it is worthy of note that syphilis with exceeding rarity displays for long periods of time a single exanthematous lesion or aggregation of such lesions exclusively in one part of the body. Lupous ulcers, often multiple and isolated, insensitive, well- or ill-determined in outline (never reniform or horseshoe-shaped), with supple, low edges and reddish, smooth, hemorrhagic, granulating floor, covered with crusts like soiled parchment of uniform thickness, do not resemble those of syphilis. The latter are often painful, single, circular, and clean cut in contour, with firm, raised, infiltrated margins, and with offensive greenish and blackish crusts, resembling oyster-shells. The cicatrices of syphilis are elegant, smooth, delicate, superficial, circular and, after pigmentation has disappeared, dead white in color; those of lupus are irregular, indurated, deforming, yellowish white and reddish yellow. Acquired syphilis is a disease of adult life; lupus commonly begins in childhood.

The disks of psoriasis are distinguished from flat exfoliating patches of lupus vulgaris by the relatively large number of the former, by the nacreous lustre of the scales, the reddish hemorrhagic surface beneath, and the sites of election of the disks, usually on the extensor faces of the limbs.

Lupus erythematosus is even more readily distinguished by its characteristics; including the absence of nodules, ulcers, and crusts, the superficial character of the morbid process, the scaliness, and occasional symmetry of the patches. An intermediate form between lupus erythematosus and lupus vulgaris has been described, but most

cases so classed probably belong to the type called by Leloir "erythematoïd lupus vulgaris," in which nodules are temporarily absent. In all such cases typical nodules of lupus vulgaris develop sooner or later and confirm the diagnosis. The two diseases, unfortunately somewhat similar in name, are distinct in character. The so-called intermediate forms may be instances of flat and scaly epitheliomatous infiltration going on to ulceration.

In acne rosacea with a bulbous condition of the tip of the nose the redness is vivid; and the telangiectasic complications, with the seborrhœic flux, are conspicuous points of difference from lupus vulgaris. There is, further, no ulceration and little scarring, and the patients have usually suffered from the disease only after arriving at maturity. The mucous surfaces are also spared.

The diagnosis of verrucous growths of tuberculous nature is to be made after an investigation of the history of each case, which often includes a record of contact with cadavers or persons capable of communicating the disorder. The epitheliomatous warty growths on the dorsum of the hands of elderly persons are not to be confounded with tuberculous lesions. In the former there is commonly a history of longer existence of the wart, and no record of suspicious contacts; while a careful search will usually determine epitheliomatous metamorphoses over the cheeks or temples of the elderly man or woman with epitheliomatous warts on the hands. In the latter, too, the facial lesions are usually multiple, fatty-looking scales, thicker in one part than another, resembling those of a severe seborrhœa, but which are removed with difficulty, and which then leave a bleeding surface beneath.

In the orificial cases it must be remembered that tuberculosis of the viscera is a probable coincident disease. The microscope usually is needed for an exact diagnosis.

In obscure cases of any variety Koch's old tuberculin in doses ranging from one quarter of a milligram (.00025) to three milligrams (.003) may be used for purposes of diagnosis and is valuable. Both a local and general reaction usually follows in positive cases. For details see chapter on General Diagnosis.

Treatment of Tuberculosis Cutis.—The internal treatment of tuberculosis cutis is practically that indicated by the condition of the patient, inasmuch as no medicament is known to be capable, after ingestion of relieving the victim of his local ailments. Of the articles in this category none will be more often indicated than cod-liver oil, the chalybeates, creosote, the bitters, the preparations of iodine, and possibly phosphorus. Iodoform and potassium iodide have been recommended by Neisser, who employs the former in pills, each containing $\frac{1}{2}$ grain (0.033). Guaiacol and creosote carbonate, either of them, in 5 grain (0.33) capsules, have been used with varying degrees of success. In London thyroid-extract has been given for cases of extensive tubercular disease of the skin with seeming benefit, though no complete cures are reported. The hypophosphites are useful in

many cases. Arsenic and mercury are powerless to prevent extension of the disease. It is needless to add that a diet of the most generous character is to be supplied, and the rules of hygiene enforced.

Patients of the tuberculous class manifest in the highest degree the beneficial effects of a change of residence and climate—to the seashore or mountains from the interior valleys or plateau-lands; often the reverse for those who reside by the sea or in mountainous countries. It is the change which seems to produce the greatest benefit. An abundance of pure air and a life permitting out-of-door exercise are of the highest importance. The thermal and other springs of several countries furnish resorts where the benefit received is proportioned to the salubrity of the climate rather than to the special advantages of the waters furnished. Unfortunately, a large number of the patients affected with lupus and scrofuloderma are impoverished inmates of public charities or applicants to dispensaries, where these aids in the management of their ailments cannot be utilized.

The local treatment of lupus vulgaris should have in view the removal of the morbid growth as painlessly and with as little resulting disfigurement as possible. These ends may be attained by surgical measures and by chemical and other applications.

The most satisfactory results in the treatment of lupus vulgaris are obtained with the Finsen light. Not only is the method successful in removing the disease in the large majority of the cases, but the scars produced are much less disfiguring than those left by other methods, except the results obtained sometimes by radiotherapy, or in some of the circumscribed areas treated by Lange's plastic method.

Finsen and Forchhammer¹ have published the records of the first 800 cases of lupus vulgaris treated in Finsen's Lysinstitut in Copenhagen. These 800 cases were treated between November, 1895, and November 1, 1901. On October 1, 1902, the status of the cases was as follows:

Excluding 71 cases in which death, illness, or other causes prevented a continuance of the treatment, there remained 729 cases in which the treatment was tested properly. Of these, 40, or 6 per cent. of the total number, received little or no benefit. The remaining 689 patients, or 94 per cent. of the whole, were either entirely cured or much benefited by the treatment. Fifty-six per cent. were healed entirely, 17 per cent. having been under observation for periods varying from two to six years, without recurrence of the disease. Eighty-two per cent. of the entire number were either entirely healed or showed but slight traces of the disease. These results are far better

¹ Mittheilungen aus Finsen's med. Lysinstitut, Nos. 5 and 6. German translation, Jena, 1904. The report contains 226 pages of text and the photographs of 48 patients before and after treatment. The tables are prepared with the greatest care and detail, the cases being subdivided into four grades of severity; four grades according to extent of surface involved; and further according to the duration of the disease, age of the patient, and coincident involvement of mucous membranes. The numbers and dates of treatments, resulting reactions, periods of freedom from disease, dates of recurrences, and subsequent treatments, all are recorded accurately and definitely for each case.

than those given by any other method of treatment, and are the more remarkable when the fact is considered that the Lysinstitut at Copenhagen attracted to it a large number of cases of from ten to fifty years' duration in which all other methods of treatment had failed. In common with all who have spent any time or done any work in the Institute we can testify personally to the true scientific spirit manifested by Finsen and his associates, and consequently to the accuracy and trustworthiness of his reports, which established beyond question the value of the light treatment in this disease. The statistics demonstrate the frequency with which the mucous membranes are affected. In 72 per cent. of the cases the mucous membranes, usually of the nose, were more or less involved. Recurrences are due chiefly to reinfection of the skin from the mucous membranes, which in most situations are not amenable to the treatment by light, but have to be controlled by other methods. Moreover, it is exceedingly difficult to determine when mucous membrane lesions have been eradicated completely. The fact cannot always be decided without prolonged observation.

The reports on lupus vulgaris from the Finsen Institute alone are sufficiently convincing, but during the last few years many other observers in Europe, among whom may be mentioned Sequeira, Morris, Leredde, Gastou, Stroebel, Lesser, and Schmidt, and a few in the United States, including ourselves,¹ have established the value of phototherapy not only in lupus vulgaris, but in other forms of cutaneous tuberculosis as well.

The apparatus and general technique are described on pages 127-131. In lupus vulgaris, deep penetration of the light is desired; hence, sittings of an hour or more are necessary. An inflammation deeply situated in the skin follows and reaches its acme in from twenty-four to forty-eight hours. The entire surface then is covered with vesicles or with a single large bulla. As soon as the reaction has subsided, which usually follows in about ten days, the area is given another treatment, and the process repeated until lupous nodules no longer can be detected in the tissue. As it is impossible to decide just when the last trace of the disease has disappeared, patients should be instructed to return after a few months for subsequent examination. In extensive cases daily treatments may be required in order to keep all the surface involved constantly under the influence of the light. The number of treatments required for each area varies from one or two to six or more.

Phototherapy is not so effective, however, and may fail entirely in cases in which the penetration of light is prevented by extensive pigmentation, or in which perfect exsanguination of the tissue is impossible owing to the presence of thick or irregular scars, densely infiltrated or hypertrophic areas, or when the disease is so situated, as is usually the case in mucous membranes, as to be inaccessible to pressure and direct radiation. Crusts and other obstacles to the penetra-

¹ See report by Montgomery, J. C. D., 1903, xxi., p. 529 (with bibliography).

tion of light should be removed by the usual methods. In some instances pyrogallol and other remedies may be used to lay bare the deeper nodules before applying the light. The expense of phototherapy for small areas is no greater than that of other methods, the results are achieved as rapidly, and the cosmetic effects are assured. In large areas on covered parts of the body and where the cosmetic effect is not important, the treatment may be reserved for such lesions as do not yield to more rapid and less expensive methods.

The *x*-rays have been used in cutaneous tuberculosis by Schiff and Freund, Kummel, Hollond, Knox, Pusey, and a number of other observers, including ourselves. The method is better than phototherapy for the cases described above in which pigmentation or great thickening of tissue prevents penetration of light. The *x*-rays are capable of removing not only the lupous nodules, but also of greatly reducing and improving the thickened and disfiguring scars so often seen in the disease following its spontaneous disappearance or its removal by other methods of treatment. It is possible with the *x*-rays to produce as perfect cosmetic results as are obtained regularly with the Finsen light; but in some instances, and especially if during the course of treatment a severe dermatitis has been produced, the scars may be marked by distinct telangiectases and are not quite so perfect as those obtained in practically every instance by phototherapy. Moreover, to be effective, the *x*-rays in cutaneous tuberculosis must be pushed to the point of producing a decided reaction which is more or less painful and may necessitate suspension of the treatment for weeks at a time.

Radium has been employed in a few cases with results similar to those obtained by the *x*-rays.¹ It apparently had no advantages over the two preceding methods and its practical employment is prevented largely by the difficulty experienced in obtaining sufficient quantities of a definite radio-activity.

The thorn treatment employed by Unna gives excellent results. The thorns of the gooseberry bush are saturated in the German "liquor stibii compositus," and one or more thrust firmly and deeply into each lupous nodule which it has been determined to attack. The base of each thorn is then cut off with a pair of fine scissors and the patch covered with a zinc oxide plaster. When the thorns are cast off a simple granulating ulcer is left which in favorable cases heals without delay.

The obvious objection to each of the methods detailed above lies in the fact that an enormous proportion of lupus-patients have nasal and oral symptoms which cannot be reached either by the rays of solar or electric light or by Unna's thorns. The local treatment of these involved mucous membranes is a matter of great importance, and is described below.

Holländer's hot-air treatment of lupus is accomplished by directing upon the lupoid tissue through a metal tube of slender diameter

¹ For references see p. 131.

a stream of air at a temperature of about 300° C. The result is for the most part a destructive cauterization requiring complete anæsthesia. The resulting scars may be formidable.

The surgical procedure most frequently employed is curetting with a sharp spoon. This, with all other bloody operations in lupus vulgaris labors under the disadvantage of the possibility that tubercle-bacilli may be disseminated by the traumatism. Competent authors are arrayed on both sides of this question. Small lupoid patches certainly may be spread after resorting to most of the surgical devices employed as remedial agents. The dermal curette is a sharp-edged spoon with or without a fenestrum in the bowl to permit the escape of débris. By it the lupous growth may be completely scraped away, and, if necessary, caustics subsequently applied. Fox and others substitute for the sharp spoon the dental burr or dental excavator, though the change is not always for the better. Morris's double parallel screw-excavator is an improvement on the common burr. Often it is well to supplement the action of the spoon or excavator with the flat electrode treatment of Jackson. Gärtner and Lustgarten originally used as an electrode a flat silver plate attached to the negative pole of the battery, the plate being set in a hard-rubber ring. A current of from five to eight milliampères is employed.

The ablation of the entire lupous patch by the modern methods of surgery, followed by skin-grafting with the Thiersch or Lang method, gives good results, though the lupous growths may return sooner or later in the new skin. The objections to this method are chiefly that it involves the production of a larger and more conspicuous scar, since, as a rule, more tissue is removed by the knife than by the curette and its allies. In the Lang¹ method the excision is made to include both the sound peripheral integument and half of the subcutaneous fat-cushion beneath, the skin-grafts employed later differing from the thin Thiersch sheets in that they include the derma with the epidermis as far as the panniculus adiposus.

The local treatment of lupus vulgaris by the aid of parasitocides is based upon the infectious character of the disease; and in many cases is successful. White,² with a view to its parasitic action, applies to the lupous patches rags soaked in solutions of mercuric chloride, 1 to 2 grains to the ounce (0.066–0.133 to 30.), and also applies ointments containing the same quantity of bichloride in the ounce of salve-basis. Favorable results have been also secured by freely painting lupous ulcers with a solution of corrosive sublimate in tincture of benzoin of the strength named. Salicylic acid, 2 to 4 per cent. solutions in castor-oil, and in ointments $\frac{1}{2}$ to 1 drachm to the ounce (2–4. to 30.); sulphurous acid, or pyrogallol in ointments of 10 per cent. to 50 per cent. strength, spread on linen rags, covered with impermeable tissue, and followed by the use of mercurial plaster and iodoform, have all been successfully employed with the same object in view.

¹ Der Lupus und dessen operative Behandlung. Wien, 1898.

² Boston Med. and Surg. Jour., 1885, cxiii., p. 409.

Decidedly inferior to these are the following methods, the first named, most popular in Germany; the second, in France; the third, to-day practically obsolete, and probably not to be revived:

The Paquelin knife is extensively used in Vienna. The finer blades, especially manufactured for the purpose, are thrust, at a red heat, again and again through the lupous tissue until it is destroyed in its depth. Over the whole the larger blade is firmly passed and pressed, the blackish coal resulting being the best subsequent dressing after the serous exudation ceases. Erasion is also followed by the use of the galvano- or thermo-cautery.

Multiple linear scarification, a modification of the Dubini-Volkman method, was once claimed to have changed the prognosis of the disease. It is doubtful whether anything is to be gained by either a preliminary freezing of the part or the use of cutting instruments with many blades. The incisions may be produced with a delicate bistoury held in the fingers like a pen. They should be in parallel lines, closely set together, and crossed; should extend completely through the depth of the lupous growth; and this is determinable after some practice by the cessation of the creaking resistance which the blade fails to discover in normal tissue. Further, these incisions should extend laterally beyond the borders of the lupous patch into the sound peripheral zone. The bleeding is trifling and readily arrested by firmly pressing small pieces of fine sponge, lint, or absorbent cotton over the part. The edges of the incision unite either by granulation or by first intention; and in both cases seem to serve as starting-points of the reparative process, the material for which, as already pointed out, seems to be supplied from the lupous nests themselves. Subsequent operations, when needed, require a previous freezing of the affected surface. In France and in some portions of the British Empire this method is still popular.

Treatment by chemical cauterization alone is obsolete. The various acids and alkalies, particularly potassium hydroxide and lactic acid, Cosmé's paste, silver nitrate, arsenical, mercurial, and zinc compounds, and sodium ethylate have all been employed thus, and in suitably selected cases have been in the past productive of fairly satisfactory results.

With or without surgical interference, local applications may be employed, such as oily and fatty substances for the softening of crusts; stimulating dressings of tar, iodated glycerin, thymol, guaiacol (Funk), ichthyol, carbolyzed glycerin, iodized phenol, fluorine (Phillipson), naphthol, chrysarobin, and iodoform; as also the carbolyated unguents appropriate for the reparative phases of the ulcer left after the destruction of the lupous growth.

Unna advocates the topical application of 2 parts of beech-tar creosote to 1 part of salicylic acid, the latter for its marked effect upon lupous tissue, and the former for what is supposed to be its anodyne effect in obtunding the pain produced by the action of the acid on the surface. That this explanation of the effect of the com-

bination is not wholly correct is shown by the well-known fact that creosote alone is capable of producing a curative effect upon lupous tissue. In a former edition of this work, issued before the date of Unna's experiments, creosote was set down as the *dernier ressort* of the physician in the topical management of lupus vulgaris. It can be used with the greatest advantage in severe cases not only by being brushed freely over the part, but also in the combinations suggested by Unna. It will be found that when employed alone it is far from having at first the local effect of a "morphine of the skin," being productive, where no cocaine has been previously employed, of exquisite pain, which, however, is usually short lived. It should be applied only with the greatest caution by the practitioner's own hands, its effects watched and, if need be, counteracted, as in the local employment of potassium hydroxide. Trikresol operates in a similar manner.

The application of fuchsin in 1 or 2 per cent. alcoholic solutions painted over the part, which has been previously scarified, is advocated by Fox and others. We have employed pyoktanin-blue in some cases with satisfactory results.

In some of the German hospitals the new tuberculin-R, Koch's lymph, is injected, and it is claimed, with a larger success than follows the older methods. It has not been unattended with danger and fatal results have in a few instances been recorded after its injection. In other cases general tuberculosis has been induced; while in yet others the degree of improvement following its employment has been inferior to that more readily reached by other therapeutic measures. The dose is $\frac{1}{500}$ to 1 milligramme, the strength being very gradually increased from the smaller to the largest amount named.

The injection of calomel into the lupous patch has been followed by good results in the hands of Da Costa, Brouse, and Tschlenow.

The treatment of verruca necrogenica and other verrucous tuberculoses of the skin is practically that of lupus vulgaris. The curette may be followed by one of the caustics advocated above, preferably by pyrogallol, or a combination of salicylic acid and creosote. As a rule, mercurial lotions and salves are not well adapted to penetration of the warty or corneous envelope of the growth.

The orificial lesions of tuberculosis cutis may, however, be well treated by these lotions, especially one in which $\frac{1}{2}$ to 2 per cent. of mercuric chloride is dissolved in compound tincture of benzoin or tolu.

Veiel applies in all the cutaneous tuberculoses pyrogallol-vaselin in the strength of 10 per cent., spread upon lint for three or four days. One part to twenty of salicylic acid may often be advantageously added.

The local lesions of scrofuloderma may require the use of hot borated lotions applied temporarily, or kept permanently in contact on compresses covered by impermeable tissue. The results of surgical ablation of enlarged lymphatic glands, broken down or threaten-

ing scrofulous "gummata," and the complete disinfection and aseptic treatment to the point of cicatrization of the resulting wounds, furnish proofs of the progress of modern surgery.

Prognosis.—The prognosis of tuberculosis of the skin in all its manifestations is in the highest degree variable. Many patients affected with lupus vulgaris even after the production of the severest grade of deformity, recover and without further local manifestations gain a degree of facial comeliness that is marvellous. The scrofulodermata in the same way are remarkably improved, in the majority of all cases, by skilful medical and surgical management. In other cases systemic tuberculosis develops after even a single tuberculous infection, and grave results may occur either early in life or after years of tuberculous involvement of the skin and other organs. Other things equal, the prognosis in tuberculosis of the skin, as compared with that of other organs, is relatively favorable, due to the sparsity of tubercle-bacilli in most cutaneous lesions, the skin being exposed too largely to external influences to form a good field for development of new colonies of bacilli. Any form of tuberculosis of the skin, however, may result in systemic infection and death.

Erythema Induratum.

(ERYTHÈME INDURÉ DES SCROFULEUX, Bazin.)

Erythema induratum is a chronic recurring disorder, usually involving the skin of the legs of young individuals, characterized by deeply situated nodosities and ulcerations.

Symptoms.—The beginning of the disorder is marked by one or several deep-seated nodosities located in the hypoderm, which gradually extend to the surface and undergo necrosis, producing ulceration, or after absorption, atrophy. They occur in successive crops, and may continue for years. They are usually bluish-red in color, though they may be a vivid red. They are painless as a rule, though pain may ensue after ulceration has occurred. The disease commonly attacks the calves of the legs of girls from fourteen to twenty years of age. Crocker has seen it in a woman of over fifty, but she had suffered with the disease earlier in life. It also has been observed but not often in boys and men. The front of the leg may be involved occasionally, and also the thigh and even the upper extremities (Crocker and Galloway). The nodules are hard, and can often be felt by palpation when not visible. They vary in diameter from one-half to one inch or more. Node-like patches may also be present. The lesions are symmetrical and may be few; but in time a number develop. The ulcers are irregular, ill-conditioned, with puriform contents, and tend to heal slowly, leaving scars. At a given time there may be present nodules, ulcers, atrophic areas, and scars, some of these being relics of former attacks. The disease occurs, as a rule, in public practice and is comparatively rare. It has been observed in connection with tuberculides of the folliclis type, and also in patients having tuberculosis elsewhere than in the skin.¹

¹ Crocker, *Diseases of the Skin*, 3d ed., p. 812.

It is probable that, in the past, two diseases have been described under this heading: first, as described above, that which is the type and is probably tuberculous; the other an ulcerative process due to vascular disturbances (Galloway,¹ Whitfield²), this latter often occurring at a more advanced age, being more painful and more amenable to treatment.

Etiology.—The affection occurs most frequently in the winter, and much more commonly in the female sex in the second decade of life. Washerwomen and shop-girls who stand much are liable to it. Its subjects often have a weak peripheral circulation, evidenced by cold blue hands or a chilblain tendency. The tubercle-bacillus, in the light of recent study, plays an important role in the type cases.

Pathology.—From the studies of Fox,³ Thibierge,⁴ Mantegazza,⁵ and others, the tuberculous nature of the disease seems well demonstrated, although inoculation experiments are usually negative and the presence of *Bacillus tuberculosis* difficult to demonstrate. A granuloma with giant- and plasma-cells common to tuberculosis has been demonstrated repeatedly. Successful inoculations into guinea-pigs have been made by Fox and Eyre, Thibierge, and Ravant, and evidence is constantly accumulating which adds strength to the theory of its production by *Bacillus tuberculosis*.

Diagnosis.—Erythema nodosum and syphilis are the two diseases most likely to cause confusion in diagnosis. From the former, erythema induratum is distinguished by its chronic course, its tendency to ulceration, the absence as a rule of pain, lack of fever, and other constitutional symptoms, the presence of scars, and its frequent association with other evidences of tuberculosis. From the gummatous syphiloderm it is differentiated by the symmetry of the lesions, and absence of other evidences of syphilis; finally, it is not benefited by specific treatment.

Treatment.—General tonic treatment indicated in tuberculosis should be used in most cases. Rest in bed with elevation of the limbs is recommended. Before ulceration, bandaging should be practiced, and local antiseptic dressings after this last has occurred.

DERMATOSES PROBABLY DUE TO THE TOXINES OF THE BACILLUS TUBERCULOSIS.

Lichen Scrofulosorum.

(LICHEN SCROFULOSUS.)

This eruption, first described by Hebra,⁶ is characterized by its chronicity, and the occurrence chiefly upon the trunk, back, belly,

¹ B. J. D., 1899, xi., p. 206, and 1902, xiv., p. 199.

² Ibid., 1901, xiii., p. 386.

³ Ibid., 1900, xii., p. 383 (Report on the Tuberculides, presented to the Fourth International Congress of Dermatology and Syphilis).

⁴ Annales, 1889, s. iii., x., p. 513.

⁵ Ibid., 1901, s. iv., ii., p. 498 (abstr. in B. J. D., 1901, xiii., p. 438).

⁶ See his remarks before the German Surgical Society, XIV. Congress.

and thighs, of millet-seed- to pinhead-sized, firm, flat, light- to livid-red, and grouped papules. These are occasionally surmounted at the apex by a minute scale, rarely by an equally small pustule. The lesions are at the onset isolated; later they tend to arrange themselves in coin-sized patches; when evolution is accomplished they are closely set together, the surface of the skin being then of a dirty reddish-brown color, and covered with thin scales, which are readily detached. Often a crescentic outline can be determined in a group of aggregated lesions.

The course of the eruption is slow; often the cutaneous symptoms persist for months without apparent change, awakening little or no pruritus, and are followed by involution, accompanied by slight desquamation and no cicatrices. There may be recurrence.

Etiology and Pathology.—In 99 per cent. of all cases observed in Austria there was concomitance of the general symptoms of struma named above (submaxillary, cervical, and axillary adenopathy, perioritis, ulcerative dermatitis, etc.), with frequent complications, such as eczema of the scrotum. The disease was encountered in young tuberculous subjects between the periods of infancy and puberty, rarely after the twentieth year. Crocker¹ has noted its frequent occurrence in children in whom he suspected tubercular pleurisy. Jadassohn² believes that it is a disease of the tuberculous, and not of the cachectic generally, and obtained typical reactions in fourteen of sixteen cases injected with tuberculin. He has seen the disease disappear after these injections. As to the question of its toxic or bacillary origin, opinion is still divided. In favor of the former theory, Schweninger and Buzzi,³ Fox,⁴ Klingmüller⁵ and others have seen a disease apparently identical with it produced by tuberculin injections. It has been suggested that the injections may have stimulated a latent tuberculosis into activity, but in the histological study of a case thus produced Porges⁶ found merely changes of an inflammatory character, with no evidence of a tubercular structure. In a case of lichen scrofulosorum in a negro child, Gilchrist⁷ found a granuloma deeply situated, while the folliculitis which produced the clinical symptoms was more superficial.

According to Kaposi, the disease consists in an exudative infiltration of the pilo-sebaceous follicles and the perifollicular tissue. Each papule represents, therefore, the orifice of a follicle, with an infil-

¹ Diseases of the Skin, 3d ed., p. 448.

² Trans. Internat. Cong. Derm. and Syph., London, 1896, p. 425.

³ Quoted by Brocq, Twentieth Century Medicine, vol. iv., p. 359.

⁴ Archiv, 1903, lxvi., p. 401.

⁵ V. Klingmüller, Archiv, 1904, lxi., p. 167. The author gives a *résumé* of his work and observations at the clinic of Professor Neisser and in seventeen cases of Lichen scrofulosorum his findings relative to tubercle bacilli were negative and animal experiments also failed. In a small part of the cases a tuberculous structure was present, but in the major part no suggestion of tuberculosis was noted. The result of this work strongly suggests the toxic rather than the local bacillary origin of the disease.

⁶ B. J. D., 1900, xii., p. 384.

⁷ Johns Hopkins Hosp. Bull., 1899, x., p. 84.

trated perifollicular annex; and its apical scale or pustule is formed of a mass of epithelial debris or an inflammatory exudate. Porges found areas of tubercular foci composed of round, epithelioid, and giant-cells in the corium. The vessels showed perivascular inflammation, with cellular infiltration about the sweat-ducts. Jacobi,¹ Wolff,² and Pellizarri³ have been successful in finding the bacillus in the lesions or in producing inoculation tuberculosis in guinea-pigs.

Diagnosis.—The disease is differentiated readily from papular eczema by the absence of itching. From the miliary papular syphiloderm it differs in that the lesions of the latter, even though grouped, are always individually distinct. The general symptoms, moreover, are strikingly different in the two diseases. Lichen scrofulosorum should not be confounded with lichen planus or lichen ruber. Lichen pilaris, however, in a young and lymphatic patient might readily be mistaken for the disease in question.

Treatment.—Untreated, the malady produces but little inconvenience, and, moreover, yields readily to therapy. Hebra advised cod-liver oil internally and externally. Crocker advises liquor plumbi subacetatis, grains 15 (1.), thymol, grains 5 (0.33), to vaseline, 1 ounce (30.), to be applied externally, with the administration of cod-liver oil internally.

Prognosis.—The prognosis is favorable.

TUBERCULIDES (DARIER).

(TOXITUBERCULIDES [Hallopeau], PARATUBERCULOSES [Johnston].)

Under the title Tuberculides Darier⁴ classed a number of cutaneous affections which appeared to have many characteristics in common. These diseases, or, rather, cutaneous manifestations of disease, have as a rule been observed in individuals the subjects of tuberculosis in other organs than the skin, or who have hereditary tuberculous tendencies. Hallopeau and others have suggested that they are due not to the local action of bacillus tuberculosis, but to the toxins floating in the circulation from a distant focus. Fox⁵ says that if they are due to the local action of Koch's bacilli, they must be few in number, of little virulence, and readily destroyed. Darier included in this category acne cachecticorum or scrofulosorum, disseminated or agglomerated folliculitis, acnitis, folliclis, hydrosadenitis destruens or suppurativa, granuloma innominatum, disseminated erythematous lupus (Boeck), etc. Fox, in his report on the tuberculides to the International Congress in Paris, in 1900, included among others in this list acne varioliformis, necrotizing chilblains, lichen scrofulosorum, and erythema induratum scrofulosorum (Bazin). The dis-

¹ Verhandl. der Deutsch. dermat. Gesell., III. Cong., 1891, p. 69.

² Ibid., VI. Cong., 1899, p. 486.

³ Pellizarri, Trans. Internat. Cong. Derm. and Syph., London, 1896, p. 425.

⁴ Annales, 1896, s. iii., vii., p. 1431 (tuberculides).

⁵ B. J. D., 1900, xii., p. 383 (Report on the Tuberculides, presented to the Fourth International Congress of Dermatology and Syphilis).

order last named is here considered as a manifestation of tuberculosis of the skin. Evidence is accumulating rapidly which tends to confirm its position in the tuberculous column. According to Fox, "the essential lesion of the group of tuberculides is a small, extremely indolent granuloma, tending to undergo central softening and necrosis, and thus leaving scars. They are bilateral and symmetrical. The great clinical variation depends upon the depth at which the derma is affected, the implication or freedom of the glandular apparatus, the bulk of the granuloma, the distribution and number of the lesions, and the absence or presence of pustulation or necrosis." The subjects of these disorders often have a feeble peripheral circulation and are usually not robust. Two or more of these various lesions have frequently been noted in the same patient: for instance, lesions of the folliclis type on the upper, with erythema induratum on the lower extremities, or acneiform lesions with lichen scrofulosorum. A patient whose case was reported by Johnston¹ had lesions on the arms which Johnston termed "necrotic granuloma," and others on the limbs which he termed "indurated erythema." Darier reported a case in which tuberculosis was present in the lungs and elsewhere, with tuberculides of the type of acne cachecticorum on the body, folliclis on the knees and extremities, and a tuberculous gumma on the leg. Little²

FIG. 116.



Generalized tuberculide; small papular and verrucous lesions.

showed a case at the London Dermatological Society with acneiform and gummatous tuberculous lesions present at the same time. Fox notes that large gumma-like lesions often are associated with acneiform symptoms elsewhere.

¹ Phila. Med. Jour., 1899, iii., p. 443.

² B. J. D., 1902, xiv., p. 352.

Symptoms.—These vary, as described above, according to the type of lesions present. In general, the disorders are chronic, the lesions deep-seated, beginning usually in the hypoderm or corium, extending into and involving the surface; they are at first colorless, later bluish or brownish-red or lighter in shade. They may suppurate, forming a pustule in the centre of the lesion. The latter dries into a depressed crust, which, when shed, leaves a small cicatrix; or ulceration may occur, leaving a small depressed scar; or the lesion, nodule, or papule may be absorbed, leaving some atrophy with pigmentation. The lesions often are grouped and appear in successive series. Different types show a predilection for different parts of the cutaneous surface. For example, lesions of the acnitis type select the face; those of the folliclis type as a rule select the extremities. The lesions are generally painless and do not itch, and there may be a large number or only a few exhibited.

Acnitis Type.—This variety Crocker¹ describes under the title "Acne Agminata." Here the lesions select chiefly the face. They occur in distinct groups in different regions, especially upon the cheeks below the eyes, the upper lip, the chin, and the forehead. The lesions are usually brownish-red in color, though many appear semitranslucent and almost colorless. They vary in size from that of a pinhead to that of a split pea, are firm to the touch, and occasionally the small papules or nodules are capped with a vesicle or pustule. The lesions are prone to remain for a considerable time, then undergo involution, leaving a small pigmented scar, which gradually becomes less conspicuous. In some cases involution occurs rapidly when once initiated.

Folliclis Type.—In this variety the favorite sites are on the hands, forearms, feet, and legs, though the face may be attacked. The trunk seldom is affected. Here the lesions pursue a more rapid course, commonly completing their cycle in four to six weeks. They usually are noted first as red spots, which later develop into vesicle- or pustule-capped papules or nodules. They are firm to the touch and painless. The pustules dry into crusts, which reveal on exfoliation small cicatrices. While the lesions are usually discrete, patches may occur. The disease is chronic in its course. Barthélemy² reports a case lasting ten years, which had exacerbations, the patient never being entirely free. In the case of a patient recently examined by us the affection had lasted four years and appeared worse in the early autumn. This case illustrated the fact pointed out by Crocker, that the lesions on the fingers are more indolent and firm, and apparently have hard centres surrounded by a rim of pus. The disease occurs as a rule in persons having tuberculosis or with tuberculous antecedents.

Etiology.—In a large number of patients presenting these lesions, some form of tuberculosis is present. Sometimes only an hereditary

¹ Diseases of the Skin, 3d ed., p. 1164.

² Quoted by Crocker, Diseases of the Skin, 3d ed., p. 1169.

tendency is manifest. Again, absolutely no evidence of tuberculosis can be demonstrated. While the disease may occur at any period of life, the most common age is, according to Fox, between twenty and forty years. Recently the tuberculides have been noted often in children. Morris¹ has observed that measles is a frequent forerunner of the disease. The patients are prone to have a weak peripheral circulation. Both sexes are attacked.

Pathology.—The symmetry of the lesions and the early involvement of the bloodvessels point to some irritant brought to the cutaneous surface through the general circulation. In different cases different anatomical structures are affected more or less severely, which naturally alters the histological picture and has in consequence led to confusion in nomenclature. The relationship of the tuberculides to tuberculosis generally is conceded, but opinion is divided as to the exact nature of this relationship. Histologically, a tuberculous architecture has been demonstrated clearly a number of times by different observers. Many cases, however, merely show the changes incident to a simple inflammation. Inoculation experiments have, on the whole, been negative, and the presence of *Bacillus tuberculosis* in the lesions has rarely been demonstrated. The vascular changes in these conditions are evidenced by an endophlebitis, which often appears as the earliest phenomenon. Giant-cells and a tuberculous architecture have been demonstrated in different members of this group by Galloway,² MacLeod,³ Darier, Leredde,⁴ Bureau,⁵ Little⁶ and others. Pollitzer,⁷ Fordyce,⁸ Unna,⁹ Dubreuilh,¹⁰ and others have noted special involvement of the coil-glands in some cases, but even these Leredde and Bureau consider secondary to a granuloma of tuberculous origin. In a histological study of two cases, one the acneiform type, the other the so-called scrofulous gummata, MacLeod and Ormsby found in both cases giant-cells and a typical tuberculous structure, with two tubercle-bacilli in the latter.

Treatment.—The treatment of the general health is important in a majority of these cases. The hygienic surroundings should properly be regulated. Fresh air, sunshine, and good food are of prime importance. Cod-liver oil, iron, and other tonics, according to the special indications, should be used. In the folliclic type Crocker advises thiol, grains 5 (0.33) three times daily, with applications of 10 per cent. vasogen iodine. Antiseptic washes, such as boric-acid solution or bichloride of mercury (1:5000), may be necessary. Excision may at times be employed. Mercurial plaster or an ointment

¹ Diseases of the Skin, 1903, p. 422.

² B. J. D., 1901, xiii., p. 17.

³ Ibid., 1901, xiii., p. 367 (report on the Histopathology of Two Cases of Cutaneous Tuberculides, in one of which tubercle-bacilli were found).

⁴ Quoted by Crocker, Diseases of the Skin, 3d ed., p. 1167.

⁵ Ibid., p. 1169.

⁶ B. J. D., 1901, xiii., p. 185.

⁷ Quoted by Unna, Histopathology, p. 399.

⁸ J. C. D., 1891, ix., p. 128.

⁹ Histopathology, p. 399.

¹⁰ Arch. de Méd. expér., et d'Anat. path., 1893, s. 1, v., p. 63.

containing ammoniated mercury (1:30) may be applied. Radiotherapy has been of distinct value in several cases treated by us.

“**Tuberculous Eczema**” (Unna) is merely an exudative affection, which may be recognized in proximity to the scrofulodermata, a process awakened by the irritative effects of the latter; or the disease occurs as do other affections, in scrofulous patients.

Melanoderma of the Scrofulous (*Pigmentary Tuberculide*).—In some of the subjects of scrofula and tuberculosis a hyperpigmentation of the skin has been produced strongly resembling the pigmentary syphilide. The coloration is in varying shades of brown, and forms a reticulated staining of the regions about the face and neck, though other parts may be involved. Between the pigmented spots lighter points and dots of a less deeply stained integument are commonly visible. The well-known influence of tuberculosis of the adrenals in the production of pigment-changes in the skin lends color to the belief that some of these cases are due to the toxins of a tuberculosis of non-integumentary tissue. Similar pigment-changes in the skin have been determined to be the result of paludism, carcinoma, syphilis, and other disorders; and it is reasonable to conclude that the changes here set down in some instances at least are the product of tuberculous toxins.

Lupus Erythematosus (consult the following chapter) is by some authors classed with the disorders grouped under the title of tuberculosis cutis or as a paratuberculosis. The evidence that it is itself a cutaneous tuberculosis is wanting. That, however, it is in some cases a dermatosis of tuberculous subjects cannot be questioned.

LUPUS ERYTHEMATOSUS.

(Lat., *lupus*, a wolf.)

(LUPUS SEBACEUS, LUPUS SUPERFICIALIS, “SCROFULOUS RING-WORM,” SEBORRHŒA CONGESTIVA, LUPUS ERYTHEMATODES, LUPUS NON-EXEDENS, ULERYTHEMA CENTRIFUGUM. *Fr.*, SCROFULIDE ERYTHÉIMATEUSE, ERYTHÈME CENTRIFUGE.)

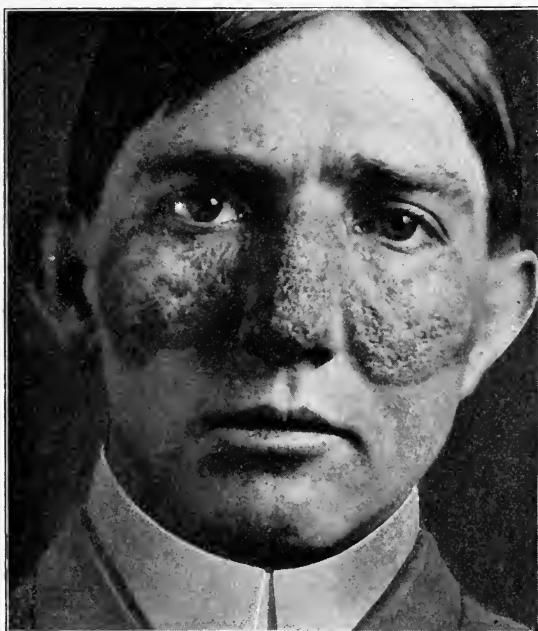
This disease was first described by Bielt under the title *Erythème Centrifuge*. Hebra, in 1845, described it among the seborrhœas, as *Seborrhœa Congestiva*. Its present title was given by Cazenave in 1850.

Symptoms.—The disease is first exhibited in one or several rape-seed- to bean-sized, slightly elevated, reddish macules which do not entirely fade under pressure and are covered with a grayish or yellowish and sometimes slightly greasy, adherent scale.

In the ordinary **Discoïd** form of the disease the primary lesion described above enlarges its periphery in the course of months or years by a slowly continuous development. It may thus gain the size of a small coin or a large saucer. The disks or patches are well

defined in outline, of a color varying with the complexion of the patient and with the acuteness or type of the disease, from a rosy-pinkish to a deep-purplish hue. The shape is usually circular, oval, or in figures representing combinations of these outlines, but it may be irregular from the junction of two or more progressing patches. Its border is red, firm to the touch, and distinctly elevated, and not infrequently exhibits comedones or light adherent scales. The centre is depressed, paler in color, and shows either adherent yellowish-gray

FIG. 117.



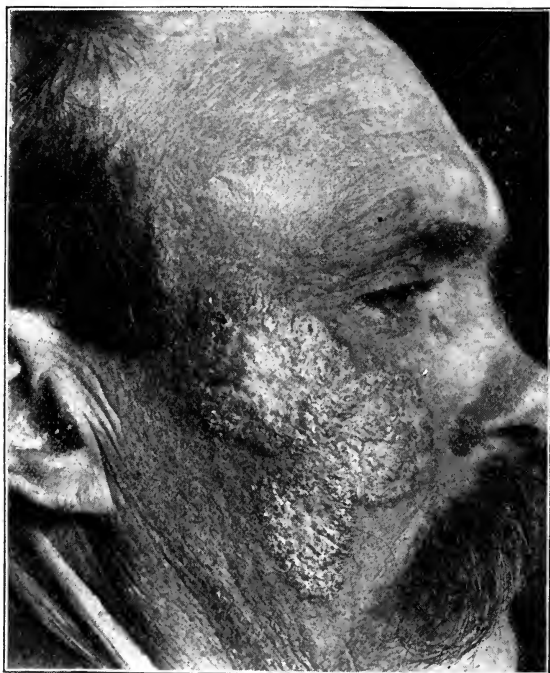
Lupus erythematosus of the face.

scales or a glistening unbroken epidermis. Close examination will disclose in most cases dilated follicular openings which may be plugged with dried sebaceous matter or horny epithelium. The scales vary in color, being at times of a clear white or whitish yellow, and again often from concurrence of comedones of a reddish or brownish tint. They are usually scanty and adherent, but may be abundant, and occasionally can be seen firmly fastened to the orifice of the excretory duct of a sebaceous gland by means of a horny projection from the under surface. In some cases the erythematous redness, in others the crusted surface of the disk, is the most pronounced feature. In the latter there are seen at times patches exhibiting almost a pure type of seborrhœa faciei.

It may spread symmetrically over the nose and cheeks in a form that has been likened by Hebra to the open wings of a butterfly. The disease is seen most frequently on the different parts of the face, ears

and scalp, and may occur on any part of the body. On the scalp small irregular patches or larger areas may appear. There is usually more infiltration, and more pronounced scar formation, but less color and less elevation of the border than in lesions of the face. The dilated follicles and comedones are often pronounced. The alopecia which results is permanent. On the hands¹ and feet the disease may

FIG. 118.



Lupus erythematosus (seborrhœic type).

occur in the usual form or as a persistent erythema with slight scaling, but it more commonly begins as a lupus pernio. The mucous membrane may be involved, presenting reddened plaques with minute excoriations, or be partially covered with a whitish exudate or with punctate scars.

As the borders advance the centre not infrequently undergoes involution, and may show typical scars even while the outer rim is actively progressing. When the disease undergoes general involution both the centre and the border gradually become paler in color and less elevated. Some of the patches resolve without leaving a trace of their existence, but in most instances typical scars are left. These are indelible and characteristic. They are generally uniform and superficial, can be pinched up readily between the thumb and finger, are of a dull whitish tint, and rendered punctate in a peculiar manner, sug-

¹ Cf. paper by me, with 35 tabulated cases in which the hands were affected (J. C. D., 1884, ii., p. 321).

gesting the action of the engraver's tool in what is known as the "stippling" process. They are never pigmented, puckered, radiate, stellate, corded, or deeply attached. Subjective sensations are usually slight or absent, but some itching or burning may be present during periods of activity in the lesions.

The disease is remarkably chronic in its course, lasting in cases for a quarter of a century or even longer, and throughout not interfering with the general health. So-called "galloping cases," usually with marked visceral complications, are described by French writers. Though the disease usually progresses by a very slow extension of the border, it may, after remaining comparatively stationary for months or years, rapidly advance for a short period and then again remain stationary. These periods of rapid progression usually follow or are accompanied by a peculiar type of acute dermatitis suggesting a mild form of erysipelas.

Lupus Disseminatus.—The disease may occur in a diffuse form. As a rule, the lesions first appear on the face, but later they may develop on any part of the body, and often large surfaces are involved. The lesions are small, varying in size from that of a pinhead to that of a bean, and though usually presenting characteristics similar to the beginning patches of the more common type, they may assume atypical forms resembling the lesions of erythema multiforme, urticaria, syphilis, acute psoriasis, or pityriasis rosea. At times the subjective sensations are severe (itching, burning, heat, etc.), and the patches may even be the seat of vesicles, pustules, or bullæ. This form of the disease is accompanied in most instances by such systemic disturbances (arthritic, gastro-intestinal, and febrile) as occur in erythema multiforme. In rare instances there are changes suggesting erysipelas sometimes accompanied by typhoid and other malignant symptoms. This condition was designated by Kaposi as erysipelas perstans faciei, and he reported that in 50 per cent. of the cases death resulted.

Unusual Types.—Fr., ERYTHÈME CENTRIFUGE.—Among the unusual types of the disease may be mentioned this acute form which has most of the characteristics of the described varieties, in which the symptoms are more acute and the vascular elements more marked. This condition may disappear, leaving the skin entirely normal, or it may be followed by the more common type of the disorder. The reddened plaque has been by several authors likened to the lesions of exudative erythema, being hot to the touch, tender, raised, and manifestly centrifugal in its mode of extension.

TELANGIECTATIC.—This form is occasionally seen. Here points, spots, plaques, or large disks on the surface, chiefly of the face, usually well defined, present a rosy-reddish, or deep-purplish color which disappears under pressure. When examined with care the color is seen to be due to dilatation of the cutaneous vessels. The surface may be either slightly œdematous, or infiltrated, and correspondingly elevated. There is an absence of scaling and of dilated follicles, but typical scars not infrequently follow the involution of this type of the disorder.

LUPUS PERNIO¹ is another unusual form in which the lesions are exhibited on the fingers and toes particularly but also on other parts of the hands and feet and on the pinna of the ear, beginning as a more or less persistent erythema of the type of pernio (chilblain). Like the latter disease, this erythema may disappear and reappear with the seasons for several years, but eventually may persist and assume the discoid type.

THE LIVEDO FORM.—A rare subvariety is recognized on the face, hands, and other regions where the symptoms present the character of local asphyxia. Here the influence of the trophic nerves, as in other conditions with similar symptoms, is distinct. The disease begins with the production of livid spots in the regions named, which persist for months or even years, and eventually degenerate at the centre, leaving a slough beneath which is an ulcer. In these cases, also, tuberculous complications may occur in the joints.

Etiology.—The disease is more common in women than in men, two-thirds of the former to one of the latter, and usually appears first in the third decade of life, in this particular presenting a contrast with lupus vulgaris. It may, however, first develop in childhood, middle life, or old age.

Lupus erythematosus may follow eczema seborrhœicum, acne, undue exposure to sunlight, variola, erysipelas, vesication with cantharides, or traumatism from any cause. It may appear where the curette has been employed in a patient with a characteristic patch elsewhere on the face. It occasionally develops on portions of the face and hands that have been subject to recurrent attacks of pernio, and it is generally accepted that enfeebled circulation and local irritation are prominent causal factors. It occurs in conjunction with anæmia, chlorosis, and other disorders. In many patients careful investigation fails to discover any other evidence of ill health. By an increasing number of writers the disease is considered a chronic inflammation due to a toxic infection, the exact nature of which is not known.² Its association with erythema multiforme is frequently observed.

The relation of lupus erythematosus to tuberculosis has been a much disputed question. The disease is described by some writers as a variety of lupus vulgaris, but the histopathology of the former disease, the absence of tubercle-bacilli, and the negative results of many inoculation-experiments seem sufficient to disprove such relationship. The transitional forms occasionally reported usually prove to be mild and unusual types of lupus vulgaris.

Although lupus erythematosus has none of the essential characteristics of a local tuberculosis, it occurs not infrequently as a derma-

¹ Cf. contribution to this subject by me, loc. cit.

² Galloway and MacLeod, B. J. D., 1903, xv., p. 81, believe that lupus erythematosus, like erythema multiforme, may be due to toxæmias arising from various causes. See same authors in *ibid.*, 1908, xx., p. 65. Cf. also, Warde, B. J. D., 1902, xiv., pp. 380 and 447, and 1903, xv., p. 161; F. v. Poor, *Zeitsch.*, 1901, viii., p. 103; Sequeira and Belean, B. J. D., 1902, xiv., p. 367 (bibliography); Voirol, *Inaug.-Dissert.* Berne, 1903, reviewed in *Monatsh.*, 1905, xl., p. 625.

tosis of the tuberculous. Besnier was the first to call attention to the fact that lupus erythematosus is in many instances associated with general or local tuberculosis. Cases in which this association occurred have been reported by a number of observers. Boeck¹ records forty-two cases of the common discoid type, in twenty-eight of which he found evidences of present or past tuberculosis. Roth² collected records of two hundred and fifty cases of lupus erythematosus, in one hundred and eighty-five of which evidence of local or general tuberculosis could be obtained.

Tuberculosis could thus be counted as an important factor in the etiology of lupus erythematosus, but that it is the sole cause or even an essential factor has not been demonstrated. It is associated more frequently with the disseminated than with the discoid forms of the disease. Pick,³ after studying the effects of tuberculin injections in twenty-nine cases, concluded that lupus erythematosus discoides is not a manifestation of tuberculosis. Sequeira and Balean,⁴ after an investigation of seventy-one cases, agree with Pick regarding the discoid variety, but found tuberculosis frequently associated with the disseminated form.⁵ They found albuminuria in one-half of the cases of this type.⁶ The disease is seen frequently in individuals in whom there is no history or other evidence of tuberculosis in any form.

Pathology.—Lupus erythematosus has been studied carefully by a number of observers, but unfortunately they do not agree either in their histological findings or in their conclusions based upon the latter. In general it may be said that the chief changes are found in the upper half or third of the corium in the form of a dense infiltration of small round cells of embryonic type, a small proportion of which is probably the result of proliferation of the fixed cells of the part. The infiltration varies greatly in extent and in density in different types of lesions, but is most pronounced along the course of the vessels. It is often found in slight degree in the deeper parts of the corium and subcutaneous tissue; but it nowhere forms nodules as in lupus vulgaris; there are no giant-cells; and there is no degeneration of a mass of cells as in the latter disease. Individual cells here and there undergo a granular and fatty or colloid degeneration, disappear by absorption, and are replaced by new cells. The connective-tissue fibres are destroyed in the same way. Many of the vessels are seen to be greatly distended and choked with red blood-corpuscles, others show a proliferation of their walls and in some cases an obliterating endarteritis. Diffuse or localized hemorrhages are found in the upper part of the cutis. The sebaceous glands are at first hypertrophied, affected with hypersecretion, and become filled with cells and

¹ Archiv, 1898, xlii., p. 71.

² Ibid., 1900, li., p. 3.

³ Ibid., 1901, lviii., p. 358 (bibliography).

⁴ Loc cit.

⁵ Cf. Civatte, Annales, 1907, s. iv., viii., p. 263, for an excellent résumé of opinions as to the nature of lupus erythematosus.

⁶ B. J. D., 1903, xv., p. 249.

abnormal sebaceous matter. Later both they and the ducts of the coil-glands may become infiltrated, undergo degeneration, and disappear, leaving the peculiarly punctate form of scar characteristic of the disease.

The epidermal layers are involved secondarily. They become atrophied, and the interpapillary depressions of the rete as well as the papillæ are largely obliterated.

Fordyce and Holder¹ investigated a number of cases of the discoid type and describe a peculiar blocking of the capillaries with blood cells which they believe to be the primary change. They divide the factors making up the histopathological complex into the round-cell infiltration, the peculiar degenerated condition of connective tissue, and the secondary atrophy. They find that the commonly described fatty and granular degeneration is not characteristic of the process. Schoonheid,² from a histological study of twelve cases, concluded that lupus erythematosus is a chronic inflammatory process, and describes a peculiar degeneration and destruction of the elastin, which he believes to be the immediate cause of the superficial scars. Warde regards the profound stasis in the lymph and blood channels as the most important feature in the histology of the disease.³ Höllender considers the pathologic process to have its origin in the glands of the skin.⁴

Robinson,⁵ after examining a number of cases and reviewing the published reports of others, states that the primary lesion, which may be seated in any part of the corium, is focal in character, and when fully developed constitutes a new-growth, which is reticular in structure and closely connected with the lymph-channels. He concludes that "lupus erythematosus is a chronic inflammatory disease of the cutis with special histological characters, as shown by the changes in the blood-vessels by reticular tissue, by the presence of mononuclear and by the absence of polynuclear cells in the cell-infiltration; and that these changes must depend upon the presence of a poison generated *in loco*. In other words, lupus erythematosus is a local infective process—a granuloma."

Diagnosis.—The facies of the patient with lupus erythematosus of that region is usually so characteristic that the disease is there recognized with ease. When the hand and other portions of the body are involved the diagnosis is somewhat less readily established. In the hand the disease has a predilection for the dorsum, and invades the palm usually only by extension to it from behind.

From lupus vulgaris erythematosus lupus may be recognized by its occurrence originally at a later period of life; by its greater tendency to symmetry; and by the absence of nodules, ulceration, and extension to the deeper portions of the skin or underlying structures. Cases

¹ N. Y. Med. Record, 1900, lviii., p. 41.

² Archiv, 1900, liv., p. 163.

³ B. J. D., 1902, xiv., p. 447.

⁴ Berl. klin. Wochenschr., 1903, No. 30.

⁵ Trans. Amer. Derm. Assoc., 1898, p. 70.

undoubtedly occur in which the diagnosis is difficult, as in the type called by Leloir *lupus vulgaris erythématoïde*. But as in all cases of *lupus vulgaris* typical nodules appear sooner or later, the diagnosis can eventually be established.

In eczema there is usually some history of moisture; in erythematous lupus, rarely. In eczema, also, the itching is a more persistent and distressing symptom; but the acuteness of even chronic eczema, as compared with *lupus erythematosus*, will suffice to distinguish the two diseases. From dermatitis seborrhœica, however, the diagnosis may be difficult and may have to depend on a therapeutic test, the latter disease disappearing under appropriate treatment. Psoriasis is rarely, if ever, limited to a single patch on the face; it is also characterized by more lustrous and more readily exfoliating scales. Its patches are, furthermore, uniformly well covered with scales, and are of equal flatness in all parts, while those of *lupus erythematosus* are irregularly squamous, the scales being often clustered at the orifices of the ducts of the sebaceous glands, while the rim of the patch is elevated and the centre depressed. From *pernio* the diagnosis sometimes can be made only after determining whether the lesions disappear during the warm season, as in *pernio*, or persist, as in *lupus erythematosus*.

In *acne rosacea* there are marked telangiectases and papulo-pustules or nodules which are not found in erythematous lupus. In *tinea circinata* there may be a clearing, but never a cicatriform centre of the circular disk. The circular serpiginous syphilodermata of the face occur usually with other manifestations of lues, are characterized by greater infiltration, a more rapidly progressing border formed by the coalescence of individual papules, or tubercles, and in most cases the syphilitic lesions exhibit distinct signs of ulceration. The not infrequent modification or masking of a patch of the disease by an acute or subacute dermatitis (often seborrhœal in character) should be borne in mind.

Treatment.—The internal treatment of this affection is not highly satisfactory; often none is indicated or required. The general health of the individual should be carefully investigated, and all defects remedied if possible. The administration of potassium iodide, mercuric iodide, iodoform in 1 grain (0.06) doses (Whitehouse), starch iodide, arsenic, ammonium carbonate, ichthyol, sodium salicylate, and many other remedies have been advocated by different writers. It is doubtful if these articles ever do good unless indicated by the patient's general condition, while they often do much harm. The last three remedies on the list given above are said by Fox, Unna, and others, to lessen the congestion of the face. When they do produce this effect it is possible that advantage may be derived from their use. Good effects have been reported following the use of large doses of quinine and of salicin.

The number of remedies recommended for local use in *lupus erythematosus* is enormous. White,¹ in reviewing the subject, has

¹ J. C. D., 1898, xvi., p. 457.

enumerated some fifty of those most promising, at the same time calling attention to the fact that lupus erythematosus is no exception to the rule that "the curability of a disease is in inverse ratio to the length of the list of the means recommended for its cure." He admits that our treatment of this disease is wholly empirical, and not very hopeful. Unna¹ attempts a rational form of treatment based on his conception of the etiology and pathology of the disease and of the action of certain remedies. While his scheme is based largely on theories that are not yet capable of demonstration, the details of his treatment are of practical value. He calls attention in particular to the fact that, while the epidermis is exceedingly dry and hyperkeratotic, the cutis is markedly œdematous and the seat of dilated lymph-spaces and channels, and emphasizes the dangers of stimulating a dry indolent process into an active dermatitis.²

For convenience, the remedies used may be divided into three classes: the soothing and astringent, the stimulating, and the destructive. The choice of remedies will depend largely upon the type of the disease and on the character of the individual skin. In the acute, inflammatory, or vascular type soothing remedies alone should be used and on a skin which reacts readily to stimulation stronger remedies are not allowable. Nor should it be forgotten that the indolent forms of the disease not infrequently under treatment become acutely inflamed, and call for the temporary use of soothing measures. Inasmuch as the affection is one the involution of which occasionally is accomplished under the influence of mild topical applications, and is succeeded very rarely by grave sequels, the simpler measures should always be adopted first. In the way of soothing and astringent preparations, the lotions, powders, simple ointments, and pastes recommended for the treatment of acute eczema can be employed to advantage. The zinc oxide powders and lotions are especially to be commended, as are also the cold-cream salve, the Hebra, and the zinc oxide ointments. The paste containing equal parts of lanolin, vaselin, zinc oxide, and talcum makes an excellent base. Broeck's liniment (talci, amyl, āā 3ijss (10.); glycerin., 3j (30.); aq. plumbi, 3v (150.)); and Unna's "pulvis cuticolor" (zinc. oxid., boli rubræ, āā, 2; boli albæ, magnes. carbonat., āā, 3; amyl. oryzæ, 10) are valuable preparations in acute and irritable stages of the disease.

Frequently much can be accomplished through protection and compression of the surface by the application of collodion, the glycegelatins, or tragacanth-jelly. Unna recommends especially for irritable cases:

Rx	Ichthyol. (vel ichthyol. sulfon.),	3ss;	2	
	Collodii,	3v;	20	M.

For more indolent cases:

Rx	Saponis virid.,	3ss-ij;	2-4	
	Collodii,	3v;	20	M.

To the latter may be added 1 or 2 parts of salicylic acid.

¹ Ibid., p. 465.

² Cf. Warde, B. J. D., 1902, xiv., p. 447.

Unna recommends also gelanthum as a substitute for collodion in the above formulæ, for though it does not produce as much compression as the latter it is more convenient in that it may be washed off at any moment with warm water. A favorite formula with him is potass. hydrat., 1; gelanthum, 1000.

For the purpose of producing more or less stimulation of the surface there may be added to the lotions, ointments, and pastes suggested above from 2 to 20 per cent. of sulphur, or from 1 to 5 per cent. of salicylic acid, white precipitate, resorcin, ichthyol, or tar. The mild salicylated soap plasters or the plaster-mulls containing the above remedies in small amounts, or a reduced mercurial plaster may be used where a moderate amount of stimulation is desired. Excellent results follow the use of green soap applied as a plaster or in the form of tincture. It not only cleanses the patches of the scales, but also stimulates the surface, often to the extent of inducing a reparative process. The patch may be briskly rubbed either with soap or tincture of soap in combination with hot water, after which a simple ointment or one containing a small amount of sulphur or other of the remedies suggested above may be applied. When decided irritation of the parts is produced, the soap should be discontinued and the hot water and ointment be employed alone for a time. A decidedly beneficial effect is noted occasionally after the topical application, for twenty minutes at a time, of very hot water alone. After drying, the surface should be dusted with a powder or covered with a simple ointment or paste.

The following is a gentle stimulant:

℞	Zinci sulphat.,	}	āā	3 ss;	āā	2	
	Potassæ sulphurat.,		f 3iij;		12		
	Spts. vin. rectif.,		f 3iijss;		105	M.	
	Aq. rosæ,						

Sig. To be diluted as required for external use.

The following is a formula for a stronger lotion:

℞	Chrysarobin.,	3i jss;	10	
	Acid. salicylici,	āā 3ss;	āā	2
	Calaminis pulv.,	f 3j;		4
	Ætheris,	f 5v;		20
	Collodii flex.,			M.

Sig. To be applied with a brush.

The non-vascularized, indolent varieties of erythematous lupus are often treated with very satisfactory results by the topical application of a saturated solution of pyoktanin-blue. This method has the great disadvantage of producing a deep bluish stain of the face, but the disfigurement is willingly tolerated for a brief period by patients who have long suffered from the facial unsightliness of the disease itself. The solution is thickly painted daily over the entire portion affected; and the application usually may be made by an unskilled

hand. No pain is produced and no untoward effect of any kind has been noted. The applications have been repeated continuously for sixty days and more with excellent results.

Hans Hebra¹ applies several times daily alcohol on cotton pads. The evaporation of the spirit and abstraction of water produce the beneficial effect.

A combined internal and external treatment has been devised by Holländer,² the medicaments used being quinine and tincture of iodine. His method is as follows: 7½ grains (.50) of quinine or quinine sulphate are given three times a day; after taking, each area of the disease is thoroughly painted with tincture of iodine. After five or six days a rest from treatment is taken until the scale from the application has peeled off. Several courses of treatment as above may be needed, though sometimes one suffices. Holländer regards his method as specific and of value in differential diagnosis. Excellent results have been reported by many observers. Before applying the treatment the patient should be tested for any idiosyncrasy against quinine.

Lupus erythematosus has been treated successfully with phototherapy and with radiotherapy by a number of observers, including Finsen, Leredde and Pautrier, Gastou, Moris and Dore, Pusey, and ourselves.³ After seven years experience with these methods we believe they are of distinct value in selected cases. Radiotherapy gives prompt results especially in the seborrhœic variety of the disease, but to produce permanent relief from the disease there is danger that telangiectasia may later supervene which mars the ultimate result. At present our method is to employ the treatment in moderation and if the disease is resistant, to resort to other means. The high frequency current has been used with success by a number of observers.

In our experience, the lesions in which the vascular element predominates or which are subacute in type do better with phototherapy than with *x*-rays. Lesions with marked infiltration and decided involvement of the glands and follicles resist the light treatment and improve more rapidly under *x*-rays.

Liquid air and carbon dioxide snow are now being employed with some success. Sufficient time has not yet elapsed to fully determine their value, but recurrences are noted in cases where the result at first gave much promise.

In exceedingly obstinate cases, those especially in which the elevated rim of the erythematous disk refuses to yield to the simple measures described, a solution of caustic potash in distilled water, 1 part to 2 or 4, may be gently applied with a camel's-hair brush, and the alkali immediately neutralized by the addition of dilute muriatic acid as soon as the desired effect is produced. That effect, it must be remembered, is superficial cauterization only. When the sero-sanguineous exudation and reactive effects disappear the rim is seen

¹ Wien. med. Wehnschrift., 1899, xlix., p. 13.

² Berl. klin. Wochens., 1902, July.

³ J. C. D., 1903, xxi., p. 529 (bibliography).

to be flattened and to have lost in part its violaceous blush. After such severe application, which should never be trusted to the hand of one unskilled in its use, an anodyne cerate containing morphine or opium should be spread over the part.

In indolent patches where decided stimulation or even a very superficial destruction of tissue is desired, mercurial plaster, the stronger salicylated soap-plasters, and plaster-mulls are to be recommended, or creosote, carbolic acid, chrysarobin, pyrogallol, salicylic acid, and pyrogallol (1 part of the first and 3 of the second to 40 parts of flexible collodion, Brocq), silver nitrate, lactic acid, or Fowler's solution may be used. Two drachms (8.) each of iodine and potassium iodide mixed with 4 drachms (16.) of glycerin; or equal parts of chloral, tincture of iodine, and carbolic acid, are recommended highly. These stronger remedies, however, are to be used with great caution and only in indolent cases, and then only after milder measures have failed to produce good results.

In a few cases electrolysis has been of benefit. Erasion with a dermal curette,¹ as well as operation by multiple punctures or by linear scarifications, is of less value than in lupus vulgaris. Erasion has in some instances been followed by involution of the disease, but also, as a rule, by cicatrices that are no less disfiguring than the original disorder.

Prognosis.—A favorable opinion with respect to the future of the disease never can be given safely, but with improved technique a large percentage of cases should be amenable to treatment with phototherapy and radiotherapy. The general health and comfort of the patient suffer rarely. The affection is capricious in its course, and may on occasions, after long periods of persistence, rapidly improve under the simplest treatment. Spontaneous involution, with disappearance of all symptoms, is reported in some cases. The disorder is liable to relapse, though not to frequent recurrence. Its tendency to the production of persistent scars should always be remembered in formulating a prognosis. Numerous instances of the development of carcinoma upon the scar of lupus erythematosus have been reported.

SYPHILIS.

(Gr., *συς* and *φίλος*, a companion of swine: term coined for poetical purposes by Fracastor.)

(LUES VENEREA, MORBUS GALLICUS, POX, "BAD DISORDER." *Fr.*, VÉROLE; *Ital.*, SIFILIDE; *Ger.*, LUSTSEUCHE, KRANKHEIT DER FRANZOSEN; *Span.*, SIFILIS; *Swed.*, RADEZYGE.)

Syphilis is a constitutional, chronic, infectious, and contagious disease, transmitted not merely by inoculation but by inheritance. It is a malady now recognized in all countries, and has been shown

¹ Cf. Allan, J. C. D., 1903, xxi., p. 510, who strongly advises curetting under the edges of the lesion.

to be capable of transmission to human beings of both sexes and all ages, and also to some of the lower animals. It may last for but a few months or endure for a life-time. Further, it may affect more or less profoundly every organ and viscus of the body.

The established facts proving the microbic origin of other infectious diseases have made it for a long time appear highly probable that syphilis is produced by a living organism but in spite of indefatigable research conducted by experienced observers, the demonstration of such an origin has until recently not been perfected.

In the list of observers whose names have been identified with studies in the bacteriology of syphilis, none has been more widely accredited with the discovery of the special germ of this disease than Schaudinn. In the year 1905, he first distinguished between the spirochæte *refringens* recognized in a group of pathological lesions having a different origin, and the *treponema pallidum*, or spirochæte *pallida* found only in the lesions of syphilis. Since that date Roux, Metchnikoff, and others have extensively confirmed the observations of the Berlin naturalist, observations to which a remarkable impetus was given soon after by discovery of the fact that the spirochætes recognized in the human subjects of syphilis were capable of producing the disease in the anthropoid apes. As a matter of fact hundreds of inoculations of these animals in series have been made with the result of reproducing the disease after the usual periods of incubation and with development of lesions in which the spirochaetes have been if not invariably at least very frequently recognized. It would appear that the germ of syphilis is at last within the grasp of science.

The discovery of the *treponema* in syphilitic lesions in large numbers and in a sufficient number of observations is effected; the failure to recognize the same in other diseases is established; the transmission in series of the organisms to the uninfected of the lower animals has been accomplished. There is lacking yet a knowledge of the methods by which pure cultures of the *treponema pallidum* may be produced. As yet no medium has been discovered in which it can be cultivated. But its pathological importance at the present date is sufficient to place syphilis assuredly in the group of the infectious granulomata, and in the increasingly large list of disorders which are produced by a single germ and by no other.

Syphilis has been described as an "imitator of other diseases." The manifestations of the malady are certainly protean in character and are both like and unlike the symptoms of non-syphilitic affections. It is, therefore, more in accordance with fact to describe syphilis as a special mode of disease. Its phenomena differ from other pathological phenomena chiefly in the syphilitic modality with which they are impressed. After infection there is a different behavior of the living matter of which the body is constituted. Its mode thenceforward is temporarily changed as regards the process of disease. Hence the importance of recognizing this modality in relation to disease of the

skin, and of ascertaining the limits within which this influence is both originated and exhausted.

Ricord was first to classify the phenomena of syphilis in three distinct stages. In the first stage, or primary syphilis, were included symptoms relating to the chancre and its accompanying adenopathy. In the second stage, lasting from the date of the onset of general syphilis during a period of about two years, were grouped symptoms that were, as a rule, superficial, symmetrical, and more or less transitory. In the third, or tertiary, stage the symptoms included were, as a rule, asymmetrical, more profound, involving the subcutaneous and deeper tissues, and invading often not merely the skin, but also the osseous, cartilaginous, and other structures of the body, including the viscera. This simple scheme when first given to the scientific world revolutionized all previous conceptions of the disease, and has dominated the medical profession up to the present time.

But there are objections to a continued acceptance of this scheme, based largely on its incompleteness. The distinctions it seeks to make are wholly artificial, are defined by poor limits, and so often are completely negatived that they fail to explain the most important of accidents. To be consistent and to explain in part the violations of their time-schedule, the French have coined such phrases as "precocious," "tardy," "galloping," etc. Further, the mind once dominated by this scheme was educated to look for the evolution of symptoms within each of these artificial stages in a determinate order, e. g., after the occurrence of macules succeeded papules; after these, pustules, tubercles, etc., a progression rarely observed in any given case.

Symptoms.—The symptoms of syphilis are best studied, as they are clinically displayed in distinct departures from the infection-moment, along lines which are not fixed, but between which symptoms are intermingled with varying shades of severity. The four chief classes which may thus be recognized include most of the clinical pictures of syphilis:

I. Benignant Syphilis, with Superficial and Transitory Symptoms.—In this first class the skin-lesions of general syphilis are few and at times are even insignificant. A macular rash, for example, over the surface of the chest and belly, lasting for a few days or for a week or more, accompanied by ganglionic enlargement, after involution, leaves the patient for the remainder of life free from obvious signs of the malady. These instances are rare.

II. Benignant Syphilis, with Superficial and more or less Persistent Symptoms.—In this class are to be catalogued most cases of the disease. Some cases relapse to it from the class previously described; others, fewer in number, retrograde to one of the groups named below. There is throughout no cachexia, and the skin-symptoms of the affection are neither destructive nor deep. Their chief significance lies in the fact that they may persist or may recur until the disease, either as a result of treatment or of a decline due to other causes, ceases to manifest itself by any symptoms whatever.

III. Malignant Syphilis, with Profound, Relapsing, or Persistent Symptoms that Ultimately Resolve.—In this group are collected those cases in which, with persistent or with recurrent symptoms gradually involving the deeper structures of the body, the system suffers to the extent of exhibiting the signs of cachexia. Patients in this class, by reason of efficient treatment or the reverse, are readily transferred both to the second class and to the fourth.

IV. Malignant Syphilis, with Profound and Relapsing, or Persistent Symptoms that are Ultimately Destructive.—In this class are included the gravest forms of the disease: those exhibiting deep and destructive cutaneous lesions; those implicating the viscera, bones, and other structures; those interfering with the integrity of organs by reason of either atrophic or degenerative changes succeeding a circumscribed or gummatous involvement of tissue.

No one of the groups of symptoms named above necessarily follows any other. The last-described group may occur within a few months after the appearance of so-called “primary syphilis,” even though formerly included in the old nomenclature among those of late, or tertiary, type. Many cases, indeed, of grave syphilis are of the type described by the French as “precocious”; that is, they develop symptoms of gravity either before or soon after the healing of the chancre.

CHANCER.

(INITIAL SCLEROSIS; INDURATED CHANCER; PRIMARY SORE; HUNTERIAN CHANCER.)

Every attack of acquired syphilis exhibits as a first symptom an infecting chancre; and every infecting chancre points to an oncoming syphilis.

A chancre is that modification of the sound or of the pathologically altered skin or mucous membrane, preceded by a period of incubation, characterized by sclerosis, and accompanied by adenopathy, which constitutes the initial lesion of inevitable syphilis. Chancres usually appear upon or about the genital organs simply because these organs are most often exposed to the disease. These lesions may, however, occur upon any portion of the surface of the body.

Chancres appear after a period of incubation—an interval of time between the date of exposure to the disease and the manifestations of its first symptom. This period averages twenty-one days, but it may extend from ten days to two months and even more.

The chancreous modification may involve, as stated above, the normal or the pathologically altered skin or mucous membrane. Upon previously sound surfaces chancres may appear, after an incubative period, as macules, papules, tubercles, erosions, fissures, or ulcers, each, or either of which, at some future period of its history is characterized by a peculiar hardness of the tissues about and beneath the lesion, this condition being known as the “initial sclerosis.” These

symptoms vary according to the location of the chancre and the friction or other external irritation to which the lesion has accidentally been subjected. Generally it may be said that all chancres tend to conform to the papular type, the macule developing into the chancreous lesion, the tubercle being evolved from its exceptional enlargement, the ulcer from its degeneration, and the erosions or fissures from the accidents of its less pronounced features. Occurring upon mucous or quasi-mucous surfaces these lesions are influenced by heat, moisture, and friction (labia, prepuce, etc.). Here the superficial erosions are usually circular in outline, are very slightly depressed and they rest upon delicate beds of sclerosed tissue, the so-called "parchment-induration." The papule is often represented by a tolerably well-circumscribed, macular discoloration of the membrane, where coarse examination would scarcely suggest elevation of the surface, with a sclerosis of no greater extent than that of the erosion, with which it probably sustains a close relation. As a result of heat, moisture, and friction, however, the typically dry and sealing papule constituting the chancre of the integument is here rarely encountered. More often the lesion is a circumscribed ulcer with clean-cut walls,

FIG. 119.



Initial sclerosis of syphilis (extragenital chancre).

penetrating deeply to the derma or even below, with a scanty secretion and a reddish floor, resting upon a split-pea-sized mass of sclerosed tissue. Other usual forms are superficial erosions, in themselves of insignificant aspect, surmounting large nodules, tubercles,

or even long linear ridges of densely sclerosed tissue, undergoing repair or degenerating according to the condition of the patient and the treatment to which he has been subjected. These erosions are usually out of proportion to the size of the indurated mass upon which they rest. Such voluminous indurations are occasionally perforated by deep conical or funnel-shaped ulcerations of formidable aspect, to which the name "Hunterian chancre" was once applied.

Occurring upon cutaneous or mucous surfaces, where there has been a previous morbid process, the syphilitic mode is impressed upon the symptoms significant of such antecedent disease. This accident is sufficiently common, and the resulting lesions are as various as are those of different diseases. Thus, a man or woman may be infected with syphilis at the site of an herpetic vesicle upon the lip or the genitals, such vesicle being unbroken and recent, or several days ruptured; or at the site of a balanitis; or of a vegetation; or of the soft contagious sore of the genital region best recognized under the term "chancreoid." Or the inoculation may occur at the site of a traumatism; for example, where the frenum is slightly torn in coitus, or where the bruised knuckle of the accoucheur is exposed during the practice of his art.

The induration of chancres may precede, accompany, or follow the lesion with which they are associated. The sclerosis may be short-lived, persistent, or recurrent, and in this respect may resemble the chancre itself, which may endure but for a few days, or be in course of full evolution at the date of appearance of so-called "secondary" symptoms.

As a consequence, the ganglia in anatomical connection with the chancre become, with very rare exceptions, enlarged and specifically indurated. With genital chancres there is usually double inguinal adenopathy; with labial chancres, submaxillary adenopathy; with chancres of the eyelid, pre-auricular adenopathy, etc. The glands usually enlarge within a few days after the appearance of the chancre, and remain in that condition for several months. They are indurated on one or on both sides of the body; are freely movable; are unattached to surrounding tissues; are neither painful, tender, nor inflammatory, and they therefore terminate neither by suppuration nor by ulceration. It will thus be evident that the word "chancre" is applicable only to certain features assumed by other lesions, and is not itself descriptive of a lesion differing absolutely from all others. It is indeed clear that there can be no particular chancre-lesion, since in turn the macule, vesicle, pustule, papule, tubercle, erosion, vegetation, ulcer, and fissure may each become a chancre. Every other elementary lesion of the skin, therefore, may assume the chancrous features; in other words, may display in its morbid career the modality of syphilis. These chancrous features are: infection; sclerosis after an incubative period; coincident or consequent adenopathy (sclerosis of neighboring ganglia); and, after a second incubative period, the occurrence of the symptoms of general syphilis. The last-named is, of

course, an historical feature, not recognizable during the greater part of the life of most chancres.

The minor chancreous features are less constant and trustworthy. Chancres of the skin may be deeply pigmented. Some are painful from the occurrence of inflammation; some are injured by traumatism (chancre of the nipple in nursing-women); some, by irritants (caustic improperly applied); some, finally, are so insignificant in feature (chancre of the vagina) that even the expert is readily deceived in their recognition.

With or without involution and complete disappearance of the chancre, the symptoms of general syphilis occur only after a so-called "second period of incubation." This period extends usually from between the end of the first to the end of the second month after the appearance of the chancre, the average being between the fortieth and the forty-fifth day. During this period the general condition of the patient is that which, by subjective and objective phenomena, displays signals of the approaching distress of the economy. There are anæmia, and, in cases, even chloro-anæmia; wandering pains, substernal or about the articulations; a cachectic appearance; engorgement of the superficial and deep ganglia; occasionally a well-marked febrile process, the so-called "syphilitic fever"; and a special irritability of the skin and mucous membranes.

The so-called "periods of incubation" in syphilis do not, however, really exist. The words used to define them refer to periods of time in which, upon gross inspection, the evolution of the disease does not seem to be in progress, but in the course of which there is ample evidence that there is a gradual involvement of one organ of the body after another. Thus, in the "second incubative period" of the textbooks careful examination of a patient about to display the external manifestations of systemic disease discloses the fact, as suggested above, that the symptoms are by no means latent. The glands of many parts of the body beside those in the vicinity of the initial sclerosis become tumid and at times painful, including the tonsils and thyroid gland. The skin may exhibit icteroid symptoms as a result of hepatic disturbances; the excretion of urea may be augmented or albumin may temporarily appear in the urine; pains in the head, limbs, and other parts of the body may produce distress even of a severe grade; the leucocytes may relatively increase in number; the joints may become painful and swollen; and muscular contracture with many other evidences of a morbid state of the system may indicate to the careful observer that a general process of intoxication is in more or less rapid evolution.

It is at this period that what is called "syphilitic fever" occurs. In many patients a febrile movement is either unnoticed or absent. In others, the temperature may rise two or more degrees above the normal, and be accompanied by severe cephalalgia and acceleration of both pulse and respiration. A similar condition is recognized in some patients much later in the course of the disease. In yet other

cases, the fever is accompanied by marked icteroid symptoms and with neuralgias of a distressing severity.

At this moment, the "second period" of the disease being completed, the patient is ready for an "explosion" of general syphilis. Insidiously or suddenly, first noticed upon the skin beneath the clothing, with rapid efflorescence over the entire body-surface after a hot bath, the stimulus of liquor, or the excitement of the dance, appear the syphilodermata or syphilides or skin-symptoms of syphilis.

SYPHILODERMATA.

(SYPHILIDES.)

The skin-manifestations of syphilis are of common occurrence, are numerous as to their forms, and are of great importance from a diagnostic point of view.

As in syphilis of other organs that of the skin is betrayed in symptoms like and unlike those of non-syphilitic affections. The study of these differences is here also a study of the syphilitic mode of disease. In a treatise of this scope and these limitations it will be practicable to describe merely those evidences of the syphilitic process to be recognized in the integument.

Lesions of the skin appear in syphilitic individuals of both sexes, in all periods of life, and in all stages of the disease. These symptoms are, however, much more frequent during the first two years after infection, subsequent to which period the manifestations of the disease are betrayed more commonly in subcutaneous lesions, or lesions which affect the viscera, and the osseous, nervous, muscular, and vascular systems.

General Characteristics of the Syphilodermata.—The syphilodermata, like chancres, are, properly speaking, modalities of such symptoms as occur in diseases not syphilitic. The distinctive difference between the papules, ulcers, and other lesions of syphilis and those of lupus, for example, lies chiefly in the mode of evolution and involution. It is the syphilitic behavior, rather than the syphilitic lesion, which guides the diagnostician. The syphilides, in short, resemble the lesions of most of the other diseases of the skin, and they differ also in various degrees from each one of the latter. Hence is seen the importance of a clear recognition of their general characteristics.

Distribution.—The earlier skin-symptoms of syphilis are usually symmetrical, those occurring at a later period of the disease asymmetrical, though in some cases there are exceptions of importance to the rule. Predominant sites of syphilodermata are the hairy scalp, especially at its borders, the vicinity of the mucous outlets (angles of the lips and lids, anal, and genital regions), the palms and soles, the alæ and root of the nose, the forehead, the interdigital spaces of the feet, the umbilicus, and the axillæ and groins. The eruptive phenomena of syphilis may be general or few, and either conspicuous and formidable both as to their extent and persistence, or, instead, short-lived and

insignificant. As a rule, the more general and profuse the earlier rashes of syphilis, the more favorable the issue with respect to the prognosis.

Absence of Subjective Sensations.—The eruptions produced by syphilis are rarely attended by itching, burning, or painful sensations of any sort. This absence is frequently a positive aid in establishing a diagnosis, and, as a rule, is the more valuable the graver the lesion. Great difference, however, will be noted in this respect between different individuals. Occasionally considerable itching will be induced, as in condylomata of the anus; and syphilitic ulcers, especially of the leg, may be productive of severe pain. At the same time it is a common experience to find a patient, quite tranquil as regards all subjective symptoms, covered from head to foot with a brilliant macular syphiloderm, or exhibiting with the utmost composure a large number of serpiginous ulcerations on his scalp and extremities.

Polymorphism, a term used to designate the coincident appearance of lesions of various character upon one individual, is as true of syphilis as of other diseases, such as lepra and scabies. Viewing the cutaneous and other symptoms of syphilis as a whole, this feature is strikingly significant, as it is possible to observe at one and the same time, upon the body of a single infected individual, symptoms indicative of pathological changes in the skin, mucous membranes, hair, nails, lymphatic glands, and periosteum.

To a less marked degree is this true of the syphilodermata. The type of syphilitic skin-lesions is generally papular, and such lesions may originate from macules, enlarge into tubercles, or degenerate into ulcers. The simultaneous coexistence of several of these forms is due to their chronicity, to their tendency to recurrence, and to the changes which they undergo.

Career.—The historical course of the syphilides suggests certain common features. They are rarely accompanied by local inflammation, and with the exception of syphilitic fever, are usually unattended with pyrexia or with malaise. The tolerance of the general economy of an extensively developed syphiloderm is highly significant of specific infection. Again, though generally described as a chronic disease, syphilis is, judged with respect merely to time, much more acute than several other maladies. The syphilides have a distinct career, pursuing, even when untreated, a natural process of evolution, and few, save those upon the lower extremities where the force of gravity is an important element in the fixation of all local disease, persist in unvarying type for any lengthened period of time. One lesion often succeeds another by development or by degeneration; and many of the untreated syphilides disappear without leaving relics of their existence upon the surface of the skin. In these last-named particulars syphilitic cutaneous manifestations are singularly different from those of lupus and of carcinoma, for example, where the lesion is usually of one type, and persists in one location for a period of time during which a syphilide would have progressed either to much more extensive damage or to permanent repair.

Color.—There is no color peculiar to the syphilodermata that may not be seen in other diseases of the skin. It is important to recognize this fact clearly, as there are those who claim to diagnosticate the syphilides by their hue alone. The color, however, considered in connection with the other features of the syphilides, is highly characteristic, and often is sufficient to enable one at a glance to identify the disease. These color-shades are usually less brilliant than those seen in other dermatoses, and they possess less of the scarlet and pink quality. They are admixtures of red, yellow, and brown in various proportions, frequently with a slight preponderance of the brown. They have been compared with the color of raw ham and with that of copper, hues which unfortunately have been so associated with the syphilides that the non-recognition of such tints has led to many errors in diagnosis. Pigmentation in various shades of chocolate, coffee, and black is recognized, both during the evolution and completion of involution of the syphilodermata. In cases in which there has been no luetic affection the color, as in syphilis, is due to increase of pigment in the part, both with and without extravasation of blood. Recent syphilitic scars are usually pigmented both in centre and at the periphery. In these, again, it is not so much the color as it is the scar *with* the color that gives special significance to such lesion-relics.

Contour.—In syphilis the contour of single elementary cutaneous lesions, as also of a group of aggregated lesions, is usually circular, or there is a distinct tendency to assume such a configuration. Thus it is common to find outlines of patches, ulcers, and scars observing the curve of a segment of a circle, and the coalescence of several such lesions tends to produce the serpiginous aspect. Figures resembling a horseshoe, a kidney, a half-moon, the letter S, and a dumb-bell are thus produced. The earlier exanthems of syphilis are usually symmetrical, the latter asymmetrical. Even symmetrically distributed eruptions will at times occur in annular patches made up of maculopapular lesions arranged in a circular or a crescentic line. Patches of syphilitic eruption will often clear at the centre and develop or spread at the circumference of a circle.

Site.—No portion of the skin is free from the possibility of invasion by syphilis. The disease may involve at once almost the entire integument; or it may rapidly spread from point to point, having covered finally a large area; or it may appear conspicuously at distant and isolated points of limited extent; or finally it may be manifested exclusively in an insignificant lesion or a group of lesions, ephemeral in course and limited to one portion of the body. The site of a syphilitic eruption may be determined apparently by the capriciousness of the disease, and yet result from local irritation of the skin of infected individuals. The accumulations on the napkins of young women invite the occurrence of labial condylomata; the lips of the infant, after contact with the nipple of the mother, become the seat of rhagades and fissures; while the tongue of the tobacco-chewer

and the fauces of the tobacco-smoker acknowledge special sources of mischief.

There are some sites of preference for special lesions, as, for example, the squamous syphiloderm of the palms and soles; and the papules of the forehead, constituting the so-called "corona veneris."

FIG. 120.



Facial cicatrices of tubercular syphilodermata after twenty-five years of infection.

Amenability to Treatment.—Mercury possesses a singular influence upon the syphilodermata that is perceived promptly when the drug is administered internally. This singularity rests upon the broad fact that the lesions of many other cutaneous diseases not only refuse to acknowledge the benefit of such medication, but in many cases are even aggravated by it. The importance of clearly recognizing the character of each cutaneous disorder submitted to treatment is thus well illustrated.

Character of Special Lesions.—Certain families of symptoms in syphilis exhibit characteristic features. Thus, some papular lesions are surrounded at the base by a peculiar fraying of the epidermis, in consequence of which they are encircled by a little fringe of scales resembling in shape a collar. The scales of syphilis are usually not abundant, but are fine, dirty whitish or occasionally brownish in color. The crusts of syphilis are apt to be bulky, greenish black in hue, and to surmount secreting ulcers of various depths. Such ulcers are generally circular, or they exhibit in contour a tendency to assume

the circular line, while the cicatrices by which they are succeeded have a similar configuration. The scars of syphilis are frequently smooth, delicate, very slightly depressed, unattached to subjacent tissues, and pigmented. Lastly, from several of the secreting lesions of syphilis, especially those upon and about the ano-genital region, proceeds a discharge having an offensive odor and capable of communicating the disease to a sound individual.

Subjection to External Agents.—It is an obvious error to conclude that the exanthemata of syphilis are produced exclusively by the operation of a systemic intoxication. Many of the pustular syphilodermata are the result solely of pyogenic cocci, and the extension of the eruption may be by inoculation and auto-inoculation. This fact is shown not merely by the bacteriological methods of demonstration, but also by the clinical fact that these lesions are far more frequently encountered among the filthy, the neglected, and the ignorant. Often syphilodermata are commingled with seborrhœic and eczematous affections. It is not rare to find patients applying for relief in clinical practice who exhibit lesions of syphilis commingled with traces of the incursions of lice and bugs, urticarial wheals, scratch-marks, and forms of keratosis pilaris, due to the unwashed condition of the skin.

Syphiloderma Maculosum.—The cutaneous lesions of syphilis, limited to color-changes in more or less circumscribed areas of the skin, are exhibited in two distinct forms, due respectively to anomalies in blood-supply and pigment-distribution.

Syphiloderma Maculosum due to Hyperæmia (*Erythematous Syphilide*, *Macular Syphilide*, *Syphilitic Roseola*).—This form of macular syphiloderm is the earliest expression of systemic cutaneous syphilis, and is more or less constant of occurrence, differing in this respect from several of the other syphilides. Often it is unnoticed by the patient, whose attention may first be called to it after its recognition by the skilled eye of another. It occurs in coffee-bean to filbert-sized macules, roundish, oval-shaped, or of irregular contour, and varying in color from a light rosy to a dull mulberry hue. In some cases these markings of the skin-surface are very indistinct, requiring for their recognition close scrutiny in a clear light, and occasionally even then leaving uncertainty in the mind of the expert. With a lens tinted in cobalt-blue they may be recognized at an earlier date than if viewed with the unaided eye especially over the flanks. At times they constitute an irregular "marbling" of the surface, of a kind which renders it difficult to define with the eye the individual lesions composing the eruption, while the general visual effect of the exanthem is distinct. The spots are not elevated above the general level of the integument, but may change in type, a papular lesion developing later in the same site.

Like all macules of the skin due to vascular changes, those of syphilis vary in color with the complexion of the individual, with the time which elapses after their first appearance, and with vascular

changes in the superficial plexus of blood-vessels. Thus, the deeper shades are usually observed in thick and muddy-tinted skins; the more delicate tints upon the breast, for example, of blonde women.

The eruption usually appears between the sixth and the eighth week after the appearance of the initial sclerosis, and, when untreated, develops for about one week more. It may be gradual or sudden in evolution and persists for a variable period of time, depending upon the severity of the constitutional disorder and the treatment to which the patient is subjected. During the early part of its career the hue of the lesions is lighter, and they may be made to disappear under pressure of the finger; later, they become hyperæmic, are stained more deeply, and exudation having occurred, the color of the spot does not disappear under pressure. When involution is in progress there is a slow disappearance of the eruption, which gradually fades from view. The vascular changes in the capillaries occasioned by cold, heat, and rapid cardiac contractions influence the eruption to a marked degree. A hot bath, a dance, a glass of spirits, a fit of excessive coughing, laughter, etc., may all bring the lesions into prominence.

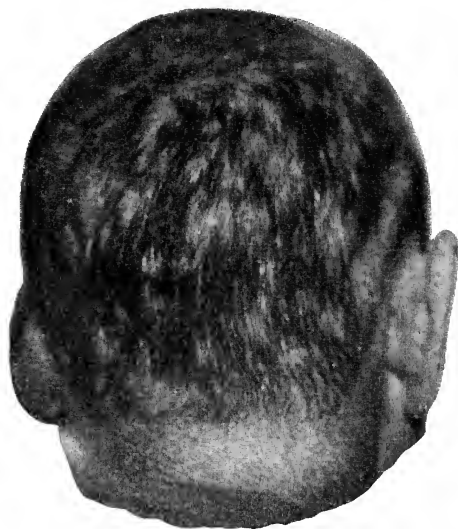
When the eruptive phenomena have been developed fully for two weeks or more, it is rather the rule than the exception to discover here and there over the skin-surface large-sized maculo-papules springing from the pure macular lesions, or sparsely distributed between the latter.

The eruption may be limited to the skin of the belly, extending sparsely over the chest, the loins, the ano-genital regions, and the thighs; may develop over the palms, soles, forearms, and legs; or, in exceptional cases, may profusely cover the entire surface of the body (face, ears, dorsal surfaces of the hands and feet, and skin of the penis with the pro-genital region). In the milder forms it is evidently susceptible to external irritation of the skin, as it is common at the wrists where a starched cuff is worn, over the brow in the line in contact with the hatband, and is particularly well developed in men where the trousers are "reinforced" (perineum and inner faces of the thighs).

At times, as in the exanthematous fevers, the eruption is preceded by a febrile state, with marked amelioration of symptoms when the rash is fully developed; while, again, it is throughout accompanied by slight rise in the body-temperature, the patient having the so-called "bilious" appearance—muddy complexion, coated tongue, icteroid hue of conjunctivæ, and offensive condition of the breath. Wandering pains in the extremities, and especially beneath the sternum, are frequently experienced. The last-mentioned symptom is highly significant, and the whole condition is probably due to the effect upon the nervous system, of the circulation of the recently intoxicated blood. These pains are not those produced later in the periosteal and other complications of the disease, and are the more significant as the eruption itself is productive of a scarcely appreciable

subjective sensation. The superficial ganglia of the body are usually engorged at the same time; the fauces are congested; the hairs of the scalp are slightly loosened in their follicles, and in the latter region in severe cases papules and pustules may form. Inasmuch as the order of sequence of most of the phenomena in syphilis is subject to a singular inversion, it occasionally happens that there is concomitance of

FIG. 121.



Alopecia syphilitica (early form).

later signs of the disease, such as iritis, affection of the nails and bones, or even, in special regions, of pustular, papular, or squamous syphilodermata.

Much less rare is the survival of the initial sclerosis to the date of this efflorescence. This point is of considerable importance. The physician should never conclude the examination of a patient complaining of suspicious genital lesions without carefully exploring the surface of the trunk, and also never pronounce upon an exanthem of this sort without minute inspection and palpation of the part where an initial sclerosis may exist. In a diagnostic and therapeutic sense the information thus gained may be precious, and in a large proportion of all cases is of a kind hidden from the knowledge of the patient.

Relapses occur in certain cases with limitation of the disease to parts previously affected or unaffected. At the end of the first twelve months recrudescence of larger macules in annular groups may occur. Exceptional forms are noted in which darker puncta appear in the macular lesion, occasionally traversed by a hair. These puncta are localizations of a more intensely hyperæmic or exudative condition about the orifices of the ducts of the follicles.

The diagnosis of this syphiloderm is readily established in view of its essentially symptomatic character. From scarlatina, measles, and r  theln it differs in the indolence of the rash, the absence in most cases of decided elevation of body-temperature, and the order of its appearance in different portions of the body, as it rarely occurs first upon the face. Urticaria and the rashes induced by the ingestion of copaiba and other medicaments are distinguished by the marked itching of the affected surface and by their very general diffusion over the entire body, a condition less often observed in the syphiloderm. Tinea versicolor, usually limited to the anterior surface of the trunk, is characterized by a fawn-colored to a chocolate-colored tint, by the furfuraceous desquamation which the patient usually describes as most noticeable after a hot-bath, and by the existence of the readily recognized vegetable parasites upon the scales scraped from the affected surface. Tinea versicolor is, moreover, of much longer duration than a syphiloderm, and almost never extends to the exposed parts of the body—the face and the hands. Ringworm of the skin of the body is not symmetrical, and is a parasitic disease. Pityriasis rosea occurs in larger, well defined, saffron-tinted, small egg-sized patches usually on the trunk only, the long axis of the patch at right angles to the vertical axis of the body. The disease is never accompanied by adenopathy.

All these distinctions, however, are not to be compared in diagnostic value with the concomitant symptoms of syphilis that are very generally present, such as adenopathy, possible persistence of the initial sclerosis, and evident involvement of other than cutaneous tissues. Such concomitant symptoms will be found occasionally with a non-syphilitic eruption due to drugs ingested for relief of the infectious disease. The most common of these drugs is potassium iodide; the eruptions it produces are frequently found both commingled with the macular syphiloderm and occurring on the eve of the appearance of the latter. The existence of acneiform lesions upon the face, the neck, and the posterior surface of the trunk, a vivid erythema of the forearms, including the hands, and purpura-like maculations of the face, legs, and feet, should never mislead the physician as to the character of the disorder with which he is confronted. It is undeveloped syphilis with a dermatitis medicamentosa of the surface. Suspension of the iodide, which drug fortunately is not required in the majority of cases, and the use of a properly selected mercurial, or even (and this is often wise) abstention from all medication, will be succeeded by disappearance of the cutaneous lesions, which may be followed later by a mild macular syphiloderm, altogether insignificant in comparison with the eruption artificially induced.

Syphiloderm Maculosum due to Anomalous Distribution of Pigment (*Pigmentary Syphilide, Vitiligo Acquisita Syphilitica, Leucoderma Syphiliticum*).—The eruption, if it may be so called, is relatively rare, and characterized by the appearance upon the body-surface of irregularly circular, usually poorly defined, dirty-brown and chocolate-

tinted macules, which, as they are unconnected with vascular changes, do not disappear under pressure. The lesions occur as sparse, well-isolated discolorations, or, more commonly after a species of confluence, as an irregular rete or network, with relatively large interspaces characterized by an absence of coloration. It occurs also in diffuse stainings of the skin in shades varying from a faint *café au lait* to a deep brown. The eruption is most common upon the sides of the neck, the shoulders, and breasts, though it may involve more rarely the surface of the trunk and the extremities. It is most frequent during the first year after infection, though it may develop later.

It occurs (*a*) as a sequel to a macular or maculo-papular syphiloderm over the parts described above; and (*b*) *ab origine*, as a pigment-disorder probably under the same influences as those productive of the chloasmata of symptomatic origin (chloasma uterinum, cachecticorum, etc.). In our experience this last is the more usual origin of the disorder.

This manifestation of syphilis in the skin belongs to a group of phenomena with respect to which there is doubt whether it be a direct product of the syphilitic virus or rather an achromia due to the causes efficient in other pigment anomalies of the skin made operative by the underlying syphilitic dyscrasia, under the influence of which alone it develops. There is good reason for the belief that the latter of the two explanations is to be accepted, Fournier, for example,¹ placing this among the group of "parasyphilitic affections" described by him, the others in the same class being for the most part disorders of the nervous system. One of the chief reasons cited by Fournier for this association is the well-known fact that the pigmentary syphiloderm is singularly insusceptible to the action of antisymphilitic treatment, and this although the symptoms are declared usually during that stage of syphilis in which the eruptive phenomena are commonly symmetrical of development and particularly amenable to an appropriate therapy—that is, during the first two years after infection. The pigmentary syphiloderm is usually unproductive of subjective sensations, is more conspicuous in the skin of blonde women but more common in brunettes, and in our experience, more frequently visible on the skins of mulattoes, Mongolians, and Indians than among persons of Aryan descent. Though more often affecting women, it can be recognized in typical development in adults of the male sex.

The color-changes observed in the skin are explained by the occurrence: first, of pigmentary deposits, possibly at the centre of the ordinary macular or papular syphiloderm; second, of peripheral absorption of such pigment-deposit, with possible persistence of it for a variable time at the centre of the lesion; third, of total absorption of all pigment from the original lesion; and lastly, of peripheral hyperpigmentation of the spaces intermediate between the original macules.

¹ Les Affections Parasyphilitiques, Paris, 1894, p. 12.



PLATE XXXIII



Miliary Papular Syphiloderm.

The eruption is an epiphenomenon of the syphilitic process, being rarely amenable to the treatment under which other macular syphilodermata speedily disappear, and is an expression rather of general deterioration of the health of the skin than of specific disease. A chief reason for regarding its origin as wholly distinct from the precedence of a syphilitic exanthem is found in the fact that while the pigmentary stains, which are relics of syphilodermata, almost invariably disappear by resorption in the course of two years when of occurrence in the upper segment of the body, the pigmentary syphiloderm has been recognized by us as among the stigmata of lues ten years and more after infection.

The eruption is liable to be mistaken for that condition in which there is simply an accumulation, upon a somewhat greasy skin, of secretions and dust, to be seen upon an integument long unwashed. *Tinea versicolor* has a more yellowish or fawn-colored tint, and, as a rule, is developed more abundantly upon the front of the chest than upon the neck. Neither vitiligo nor leucoderma is disposed symmetrically, as is usually the case with the pigmentary macular syphiloderm.

Syphiloderma Papulosum.—The type of all cutaneous lesions produced by syphilis is to be recognized in the papule. Most of the other lesions are either developed from it, transformed to it, or by reversion or admixture confess that the neoplasm of syphilis in the skin is essentially a more or less solid circumscribed cutaneous lesion, varying as to size and history.

Papules occurring in syphilis may appear as the first cutaneous evidence of infection, or they may be developed from earlier macules. They may be small, large, acuminate, flat, disseminated, or in groups.

Small Acuminate Miliary Papular Syphiloderm (*Syphilitic Lichen*).

—In this eruption the lesions are millet-seed to hemp-seed-sized, circumscribed, globular, acuminate, reddish and salmon-reddish, firm elevations of the surface, or minute nodules upon the skin, generally symmetrically developed, often over the entire body, closely set, and occasionally grouped in crescentic figures. When viewed with care a minute vesicle, a pustule, or a scale may often be detected at the conical apex of each papule, the vesicular or pustular lesions rarely developing to such an extent as to become a characteristic feature of the eruption. The color is, at first, especially in blonde skins, a species of salmon and red mixed; later, the darker and browner shades appear. When generalized, the eruption is well developed, especially over the posterior surface of the body, the occipito-cervical and scapular regions, the buttocks and the calves of the legs, though it is often distinct about the anus and the genitalia. Like several other of the syphilodermata, its earlier are more symmetrical than its later manifestations, whether these be tardy or relapsing, or both. Involution occurs by resorption of the plastic exudate, minute and usually scanty dirty-whitish scales encircling the base of each lesion. When the

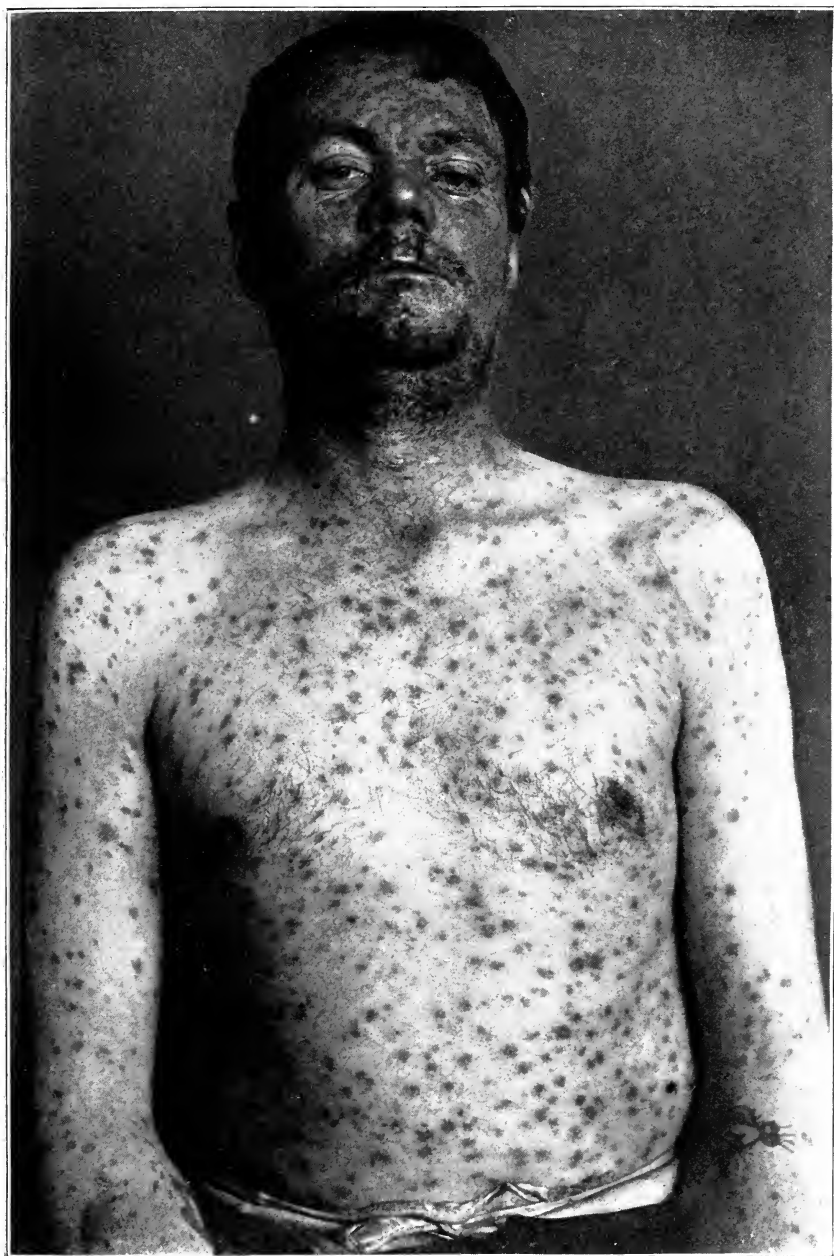
eruption has proved especially persistent, marked pigmentation follows in the form of brownish-red blotches, the centre of each of which displays a cicatriform relic in the form of a punctum.

The eruption often is noticed first about the forehead, nose, mouth, neck, and shoulders—localities commonly subject to topical irritation. Occasionally the posterior aspect of the trunk, especially the buttocks, will be affected extensively. On the face an exceedingly striking picture is presented when the papules are grouped in rather vividly tinted rings. About the forehead in men the papules will frequently be arranged along the surface pressed by the lining of the hat, and frequent fingering of the face, shaving, and irritation by the edge of the collar of the shirt may determine a more speedy efflorescence at the sites of contact. About the mouth tobacco plays the part of an excitant; about the nose a localized seborrhœa may be added to the syphilitic phenomena, in which case the lesions may be covered with thin, greasy crusts. The eruption occurs during the first six months after infection, and is usually fully developed after a fortnight when no treatment has influenced its evolution. It is observed rarely in well-treated cases, and is encountered more often when there has been ignorance or no treatment of the disease. When the lesions are perforated by hairs they suggest on superficial examination, a resemblance to keratosis pilaris, and when aggregated in patches of distinct contour they may be confounded with psoriasis or squamous eczema; but in every case the general physiognomy of the disease may well be trusted for the establishment of a diagnosis, having in mind the color, the absence of intense pruritus and serous exudation, the disposition over the body as a whole or in portions widely separated, and the rarely failing concomitant evidence of syphilitic infection. The eruption as a whole is indolent both in evolution and involution, at times persisting for weeks, though it is quite amenable to vigorous treatment.

Large Acuminate Papular Syphiloderm.—Lesions of the character above described occasionally develop to an unusual extent, attaining the size of that of a coffee-bean in localities where the apex of each lesion is free to push forward without coming into contact with adjacent planes of the integument. Thus, about the dorsum of the body, the gluteal regions, the calves of the legs, and the extensor surfaces of the forearms, fully developed, slightly scale-capped or scale-encircled, and grouped papules may appear, often commingled with pustules and superficial ulcers, the polymorphic patch having a figure-of-eight or S-shaped outline. These patches are often displayed by patients under treatment the influence of which has interfered with the full evolution of the disease.

Small Flat Papular Syphiloderm.—The lesions recognized under this title differ from those just described in that they are not acuminate, but are distinctly flattened at the apex, this flattening being at times so pronounced that each lesion resembles a small button or a plaque, the contour being roundish or oval-shaped. The lesions are

PLATE XXXIV



Flat Papular Syphiloderm.





PLATE XXXV



Flat Papular Syphiloderm.

frequently encountered on the face, especially near the mucous outlets, over the anterior and posterior surfaces of the trunk, and on the flexor aspects of the extremities. The palms of the hands are often affected. In color the papules exhibit the variation usual in individuals of different complexions, and in the same individual as they are related to the condition of the circulation. Thus, on the face a scarcely distinguishable pink will become a deep, lurid, reddish brown from an attack of sneezing, a paroxysm of laughter or of rage, and from violent exercise. The seborrhœic condition noted on the face in the acuminated lesions is also occasionally seen about the plaques. The same is true of the scaling described above. The eruption is much less copious, as a rule, than with other forms of syphilitic papules, due doubtless to the fact of its subjection to treatment. The papule differs from the lesion about to be described with respect to its size, being rarely larger than a small button; while the largest papules of the same variety may attain the size of large coins. The diagnosis has already been suggested.

Large Flat Papular Syphiloderm.—Here the resemblance of the papule to a button is even more distinct, the lesion occurring with a well-defined, firm, raised border, and a shallow depression in the centre, though at times, especially in moist situations, the superficies of each plaque is a smooth, flat plane. The large papules commonly begin as macular lesions and rapidly develop at the periphery, this development often corresponding with centric involution, by which the shallow depression described above is reduced to the level of the adjacent skin and the lesion is transformed into a ring. In shape the papules are circular and oval; in size they vary from that of a fingernail to that of a pigeon's egg. They have the usual variation in color, and may scale at the edge, or over the flat top or the depressed centre. In moist situations they frequently secrete a muco-purulent fluid which is smeared over the papules and adjacent integument, and which, in the vicinity of the anus or genitals, exhales an offensive odor. It is especially in such situations that flat papules of the type described occasionally degenerate by fissure or by circular ulceration.

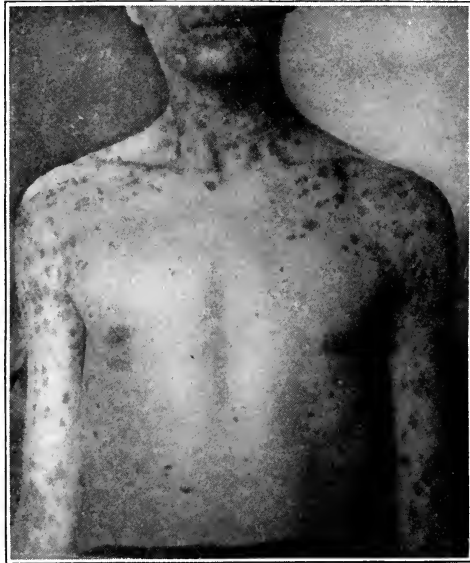
Condylomata Lata are flat and secreting papules of the regions named, which have a whitish appearance in consequence of the mucoid secretion with which they are smeared, and which are transformed by the influence of heat, moisture, and either friction or apposition of contiguous integumentary folds.

Papular syphilodermata may become generalized or be limited to certain sites of preference, as the face, the neck, the flexor surfaces of the extremities, and the ano-genital region. The eruption is either an early, a late, or an intermediate symptom of syphilis, occurring most abundantly in young and delicate skins, where the disease has been ignored and therefore untreated; and most scantily in the thicker integument peculiar to middle life, where prompt resort has been had to appropriate medication.

Syphilitic papules undergo a series of modifications under the influence of various causes which may be enumerated as follows:

(a) There is considerable hyperplasia of the cutaneous elements (papillary layer of the corium, rete, and blood-vessels), by which the papule becomes largely raised from the surface, so as to resemble a papilloma, wart, or the lesions characteristic of frambœsia. In this way, rarely, a portion or the entire surface of the body may be covered with light-red or violaceous-red, non-ulcerative, vegetating

FIG. 122.



Small flat papular syphiloderma.

growths. They secrete freely, and the discharge is liable to concrete into crusts and to exhale an offensive odor.

(b) There is considerable hyperplasia of the elements, in consequence of which the lesions spread laterally, while their elevation from the surface is prevented by contact with apposed surfaces. Thus is formed the broad, flat, moist papule known as the "vegetating mucous patch," "condyloma," *plaque muqueuse*, etc. (Fig. 123). The lesions when unaltered and fully developed, are of a whitish color in consequence of the puriform mucus which covers them, and which, as with so many of the syphilodermata in moist situations, is liable to exhale an offensive odor. When the secretion is removed the lesion is seen to be pinkish, or light or dark red in color, and to be either firm or soft, scarcely raised, and indefinite in contour, or distinctly elevated and well defined. Condylomata are chiefly found in moist situations where folds of the skin are apposed, as about the perineum, the groins, the axillæ, the mammae, the nates, the anus, the genitals, and the inner faces of the thighs. They may coalesce to form palm-sized patches; and the dried products of secretion from the adjacent mucous outlets. They are often the source of a considerable pruritus.

PLATE XXXVI

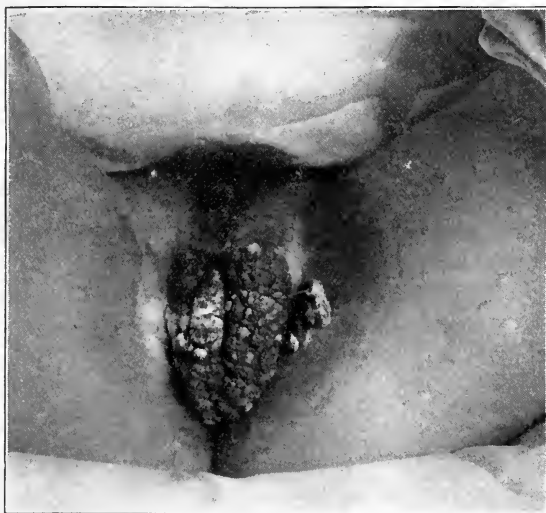


Annular Papular Syphiloderm.



(c) In consequence of changes in the superficial layers of the epidermis the papules may become covered with scales, either at the base or the apex, more commonly the latter, forming thus the papulo-squamous syphiloderm. The scales are of a dirty-grayish hue, often desiccated, generally attached, rarely freely exfoliating. They are relatively few, occurring where the lesions are closely set. The desquamation may be the most suggestive feature of the patch. Beneath the scales are seen distinctly elevated brownish-red papules or merely

FIG. 123.



Vegetating condylomata of the vulva and anus.

slightly elevated, dull-red or purplish-red maculations. When the scales accumulate at the base of the papule they tend to surround it with a circlet or collarette of exfoliated shreds of epidermis.

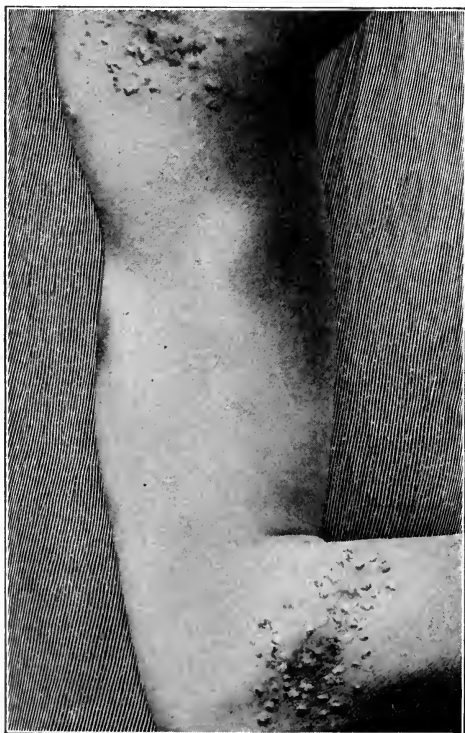
Palmar and Plantar Syphilides.—In consequence of the thickness of the epidermis in the palms and soles the papular or papulo-squamous syphiloderm of these regions is presented under somewhat atypical forms. The dense stratum corneum of the epidermis in the palms and soles is not readily raised from its underlying tissue into papular forms. The pathological manifestations of this disease are rather displayed in thickenings, separations, stainings, and frayings.

Here, therefore, are seen dull-red maculations, covered throughout or merely at the edges, by scales or epidermal shreds; minute, firm, corneous thickenings, few or many, often without color in consequence of the depth of the blood-vessels beneath the opaque horny layer; and distinctly elevated (not flattened) and circumscribed papules, or papulo-tubercles of the usual livid-red color, coffee-bean- to small-nut-sized, often aggregated in patches having a tendency to assume the circinate outline. Occasionally with a pointed instrument pin-head-sized and larger deposits resembling chalk may be pried from circular

beds in the palms and soles where the lesions first developed. These and similar spots often are covered with dirty-whitish, often tenacious, half-loosened, epidermic flakes which are characteristic. In other cases, usually in consequence of the motions of the hand or the foot, or the exigencies of toil, irregular angular losses of epidermis occur resembling the fracture of a pane of glass. The attached portions of the epidermis project at the edges only, over deep fissures, broad exulcerations, or a ham-red, tender, and newly formed epidermic stratum.

The eruption is frequently symmetrical in the centre of both the palms and the soles but is rarely found upon the dorsum of the hands and the feet, and then never developed typically, but always by extension from the palmar or plantar regions; it is also seen on the lateral surfaces of the hands, feet, fingers, and toes, as well as over the wrists and ankles. The exanthem is a persistent, rebellious, and usually late cutaneous symptom of syphilis, occurring often six, eight, and more years after infection. Rarely it is seen within a few months after the existence of chancre, and is then usually manifested in its simpler forms.

FIG. 124.



Corymbose papular syphilide.

The papulo-squamous syphiloderm bears in many instances a strong resemblance to the patches of psoriasis, but it can usually readily be distinguished from the latter by a consideration of the following points:

The syphilide, as a rule, is not generally diffused; it displays symmetry only when it involves the palms and soles, and then not invariably; it is elevated at the border of the patch; and it observes the contour of the segment of a circle. Psoriasis is more widely diffused; is generally symmetrical; does not specially exhibit elevation at the border of the patches, and the latter are rather more completely than partially circular in outline. In syphilis there is generally a history of infection, of other cutaneous or mucous symptoms of the disease, and, in married women, of abortions, miscarriages, or births of diseased children, all of which symptoms are wanting in psoriasis. In psoriasis there is a decided predisposition to the development of the disease about the extensor surfaces of the joints and the posterior aspect of the trunk; the syphiloderm, though it may occupy these situations, can rarely be found thus displayed when other surfaces are spared. The scales in psoriasis are more lustrous, are more freely produced and shed, and they exist significantly at an earlier period of the exanthem. With only such exceptions as prove the rule, psoriasis is never strictly limited to the regions of the palms and soles. A scaling palmar or plantar disease of the skin in childhood is more likely to be psoriatic, though both diseases are seen in the early periods of puberty.

Eczema is recognized yet more readily by its production of itching in varying grades, its history of discharge and moisture, and its characteristic crusts. Ancient patches of squamous eczema are often very indeterminate in outline; they do not ulcerate, and they exhibit scales on the surface of a much more deeply infiltrated area. Eczema of the palms and soles, when chronic, usually involves also the dorsum of the hands and the feet. When this is not the case the eczematous infiltration, if of long duration, will in the vast majority of all cases be found to involve uniformly and evenly the entire palm or sole, including the palmar or the plantar faces of the digits. Eczema, finally, is encountered much more frequently solely upon the right hand in right-handed patients, or to a greater extent in that organ by reason of its preference in the performance of function. This is less common in syphilis.

Syphiloderma Vesiculosum (*Varicellaform Syphilide*).—Vesicular syphilodermata are rare cutaneous symptoms of syphilis if they do actually occur. Pinhead- to pea-sized, conical, ovoid, or umbilicated, isolated or grouped, and crusting elevations of the epidermis, with lucid or cloudy contents, have been observed upon the face, the trunk, and the genitalia of syphilitic subjects. The eruption is described as an early syphiloderm, often exhibiting a halo of characteristic tint, the resulting crusts being granular and somewhat lighter in color than those commonly seen in the disease. Both small and large vesicles have thus been assigned to the disease, and these, according to their resemblance to non-specific exanthemata, have been described as varicelloid, herpetic, etc., terms of indefinite characterization.

But the larger number of the lesions are, without question, either immature pustules, eczematous lesions in syphilitic subjects, or pure accidents of the syphilitic process. With regard to the first, it may be said that the pustular syphiloderm not rarely begins as a vesicular lesion; with regard to the second, that coincidence of so common a disease as syphilis with other cutaneous disorders is a matter of frequent observation; and with regard to the third, bearing in mind the large quantity of potassium iodide swallowed for the relief of the disease and its capability of exciting a vesicular eruption, it can reasonably be concluded that some, at least of the cases of so-called "vesicular syphilis" have been studied imperfectly.

Syphiloderma Pustulosum.—In some of the pustular syphilodermata the pus is neutral; in others the staphylococcus pyogenes aureus and albus are present. The larger number of all pustular affections of the skin, whether in syphilitic or in non-syphilitic subjects, are the results of infection with pus-cocci. It is therefore not sufficient in syphilis to pronounce upon the question of infection only. It is necessary further to explain many of the external phenomena of the disease by the accidents to which non-syphilitic patients are subject.

These accidents are probably of more frequent occurrence in pustular syphilodermata than in any other lesions exhibited in the disease. Viewed as a whole, it is noticeable that pustules occur for the most part in dispensary and hospital practice, among the impoverished, the filthy, the ill-housed, and the poorly treated. They are decidedly rare in the *clientèle* of the physician consulted chiefly by those who are cleanly, well-nourished, and skilfully treated. If it were possible to keep the skin of the syphilitic subject aseptic during the management of the disease, no one would expect an evolution of pustular syphilodermata at any time throughout its course. The lesions described under this title may therefore be regarded for the most part as due to the causes suggested above, aided by picking and scratching the skin to an extent capable of distributing staphylococci over its surface. In other cases it cannot be denied that pustules, general of evolution and characteristic in appearance, may develop in consequence of luetic infection only; but even of this type they are rarely to be seen in the better class of patients.

Pustular lesions in syphilis further present a wide range of differences. They may vary in size from that of a pinhead to that of a finger-nail; they may be acuminate, flat, hemispherical, or irregular in shape; they may be few or be very numerous; they may be distinctly localized or be generally dispersed; they may be grouped or be disseminated; and they may occur from the first as minute vesico-pustules or as pustular transformations of variously sized papules. They may be surrounded by inflammatory areolæ, or may spring from an unaltered integument, or be subepidermic in situation, and scarcely project from the surface. They may be seated upon superficial or deep, or sharply cut, secreting ulcers, and they are usually covered

with crusts differing in bulk and consistency, forming thus the pustulo-crustaceous syphilide. According to the depth of the ulceration at the base are they followed by cicatrices. Pigmentation is a frequent result. The crusts which form by the desiccation of pus are usually reddish brown to greenish black in hue; they occur in strata or laminae by accretions from beneath, and even when superimposed upon a moist and secreting ulcer, they are adherent at the edges. They may occur early or late in the disease, and at either epoch may constitute trifling or grave cutaneous lesions. They have a marked predisposition for involvement of the sebaceous and pilary follicles, and they are frequently disposed about the mucous outlets of the body.

Small Acuminate Pustular Syphiloderm (*Miliary Syphilide*).—This exanthem, which usually is diffused over an extensive surface, probably represents, as Jullien has suggested, a transformation from papular lesions, due to pus-infection of skins that are usually unclean, irritated, or the seat of diminished vitality. The eruption is certainly rare in patients of the better class. The pustules are recognized generally about the pilo-sebaceous orifices, and upon minute papular lesions, which, as undisguised elements of the eruption, may be interspersed among the latter. The pustules are acuminate and contain each but a droplet of cloudy serum or pus, the desiccation of which furnishes a thin yellowish or reddish-brown crust. The fall of the latter exposes the grayish epidermal fringe of the base occasionally seen in papules of similar size. They occasion little or no subjective distress save when they occur coincidently with syphilitic fever.

The lesions may be discrete, confluent, disseminated, or in groups affecting the curve of a circle. The extremities and the trunk are chiefly involved, though the disease may be well-nigh universal. Under the influence of treatment occur minute, punctiform, and pigmented cicatricial atrophic depressions which are not persistent. The eruption may be an early or a late secondary symptom, but usually it is first seen within a few months after infection. Relapses occur when treatment has irregularly been pursued. Frequent concomitants are those symptoms of syphilis proper to the period in which they appear. Miliary papules often are interspersed among the pustules. The eruption aside from uncleanly conditions, is seen chiefly in so-called "ignored" cases.

Large Acuminate Pustular Syphiloderm (*Acneiform, Varioliform Syphiloderm*).—This exanthem of syphilis, sometimes generalized, occurring if at all within the first eight months after infection, is eminently an expression of syphilis in the filthy skin. It is exceedingly rare among the better class of patients, and can often be explained by the wearing next the skin of coarse woollen, not often laundered, undergarments by laboring-men.

The eruption consists of small or large pea-sized, grouped or disseminated, acuminate or well-rounded, fairly well-distended pus-

tules, which may be seated at the orifices of the pilo-sebaceous ducts. The lesions may begin as reddish macules, pustules, or papulo-pustules, and may have a tinted border of a coppery hue. The fact that sometimes the lesions suggest umbilication has led writers to use the term varioliform in their description, an unfortunate term which tends to introduce confusion in the description of strictly syphilitic lesions. The eruption may be scanty or profuse, be rapid or slow in evolution; may develop in crops, and may concur with syphilitic fever, as in the instance of the rash last described. When desiccating, the pustules furnish a dirty-brownish, occasionally blackish crust, covering ulcers of varying depths. The scars left may be persistent, but usually lose many of their distinctive features in the lapse of time.

The eruption, aside from the covered skins of the uncleanly, is seen also on the face (about the *alæ* of the nose and about the mouth) in the subjects of the disease who are cachectic, anæmic, or long given to excess in drink and debauchery.

The diagnosis between this eruption and variola is established readily in view of the rapid changes occurring in the last-named disease, the febrile phenomena, the order of appearance of the variculous exanthem, and the evidence furnished by other non-cutaneous symptoms of syphilis which are usually present. The drug exanthemata usually are characterized by more pronounced subjective sensations; the several forms of impetigo are seen very rarely elsewhere than on the face and hands; and acne, limited chiefly to the face and shoulders, never furnishes a distinct ulcer beneath its crusts, and is accompanied by characteristic comedones and other stigmata, over the scalp and elsewhere, of a sebaceous gland disorder. The lesions may spring from macules or smaller pustules, very rarely from an indurated or a papular base. They have a thin roof-wall, occurring by preference where the epidermis is delicate, and they are surrounded by a halo. They are usually acuminate, but after full evolution they may flatten slightly at the apex in consequence of partial collapse. The crusts are bulkier and darker in color than those of the lesions just described; their bases are ulcerated superficially. The pustules develop slowly or rapidly, in disseminated or in grouped forms, usually at an early period of the disease, though commonly after the appearance of some syphilide of another type.

Small Flat Pustular Syphiloderm (*Impetigoform Syphiloderm*).—This is a relatively frequent manifestation of syphilis, occurring upon the face, the scalp, the trunk, and the flexor surface of the extremities, usually within the first year after infection. The exanthem exhibits a decided tendency to characteristic and circular grouping about the mucous outlets of the body. Such groups are composed of small, flat, discrete pustules, pinhead- to pea-sized, originating as reddish, macular lesions which tend to dry into flattish, irregular, dirty-yellowish or brownish, adherent crusts. These crusts either exceed the limits of the diseased surface beneath, or are conspicuous

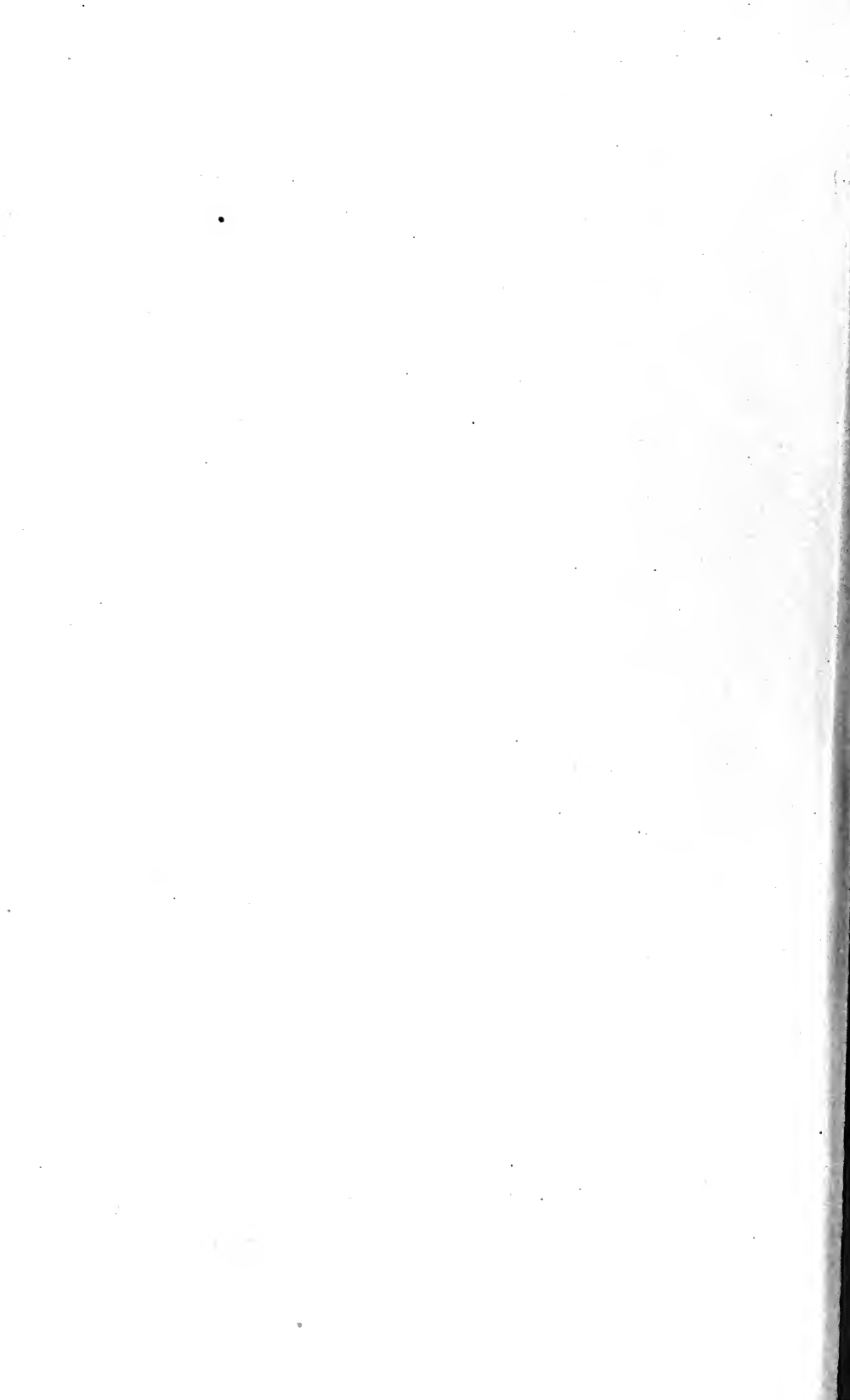
PLATE XXXVII



Large Flat Pustular Syphiloderm.



Large Flat Pustular Syphiloderm.



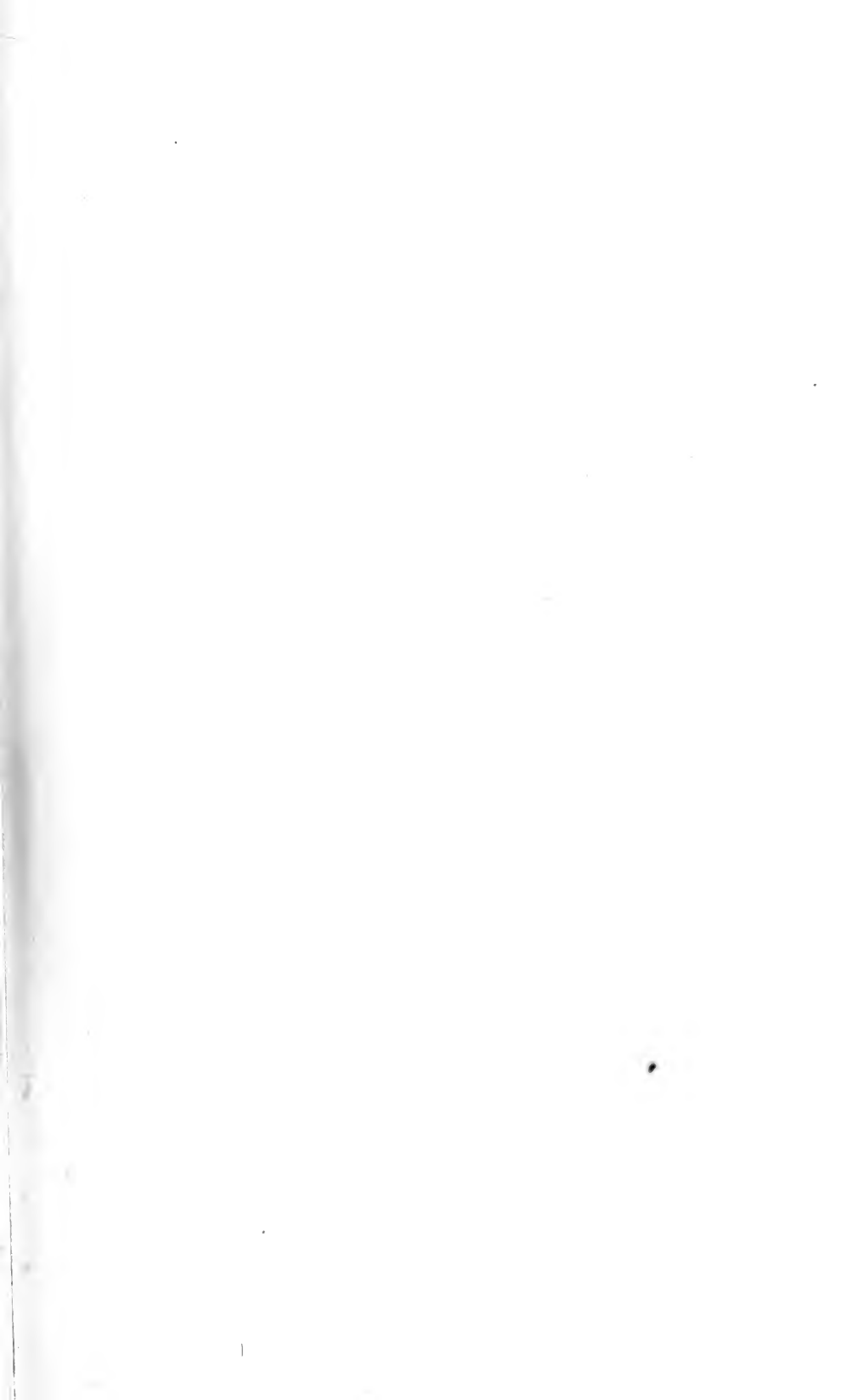


PLATE XXXVIII



Large Pustulocrustaceous Syphiloderm of the Scalp
and Body.

upon a dull brownish-red area of inflamed, eroded, and at times even of ulcerated aspect.

Often the pustules are so closely set as to become confluent, in which case a single convex crust, like a carapace, will completely cover the involved area. Frequent sites of the exanthem are the regions about the nose and the lips, as also the chin, cheeks, and the anterior faces of the elbow- and wrist-joints.

The eruption is of pustulo-crustaceous type, and it may be evolved from either papular or macular lesions. It is rarely long untreated, and is therefore not often presented for observation when in full evolution. It is usually amenable to judicious treatment; when followed by severe ulceration, destroying an ala of the nose or a part of the lip, the patient has usually suffered from either cachexia or neglect. In these cases less severe phenomena are presented in the superficial serpiginous syphilide, the lesions extending in circinate or annular gyrations about a sound or a previously involved and healed centre. Thus, a circle of crusts, with underspreading superficial ulceration, perhaps alternating with pustules of various ages and reniform cicatrices, will surround the elbow or traverse the scalp. The resemblance to pustular eczema is at times suggestive, but the ulceration and outline as well as the absence of itching will aid in their recognition. The lesions are usually late among the earlier symptoms of the disease, but they may be delayed for six months after infection. They indicate, as a rule, either severity of the disease, or, much more commonly, constitutional impairment.

Large Flat Pustular Syphiloderm (*Ecthymaform Syphiloderm*).—The lesions classed under this title are fully developed forms of those described above. They originate as usually numerous, maculopapular lesions, or as nodules or tubercles which gradually deepen into pea-sized and even larger flat pustules, the further history of which is one of enlarging, blood-mixed, reddish- and greenish-brown, also flattish, crusts with underspreading pus-bathed ulceration of varying extent. The superficial variety of this syphiloderm is distinguished from the deep chiefly by the extent of its ulcer, the size of its superimposed crust, and the lighter, dull-red areola which encircles it.

Pustulo-ulcerative Syphiloderm.—The deep variety, like the superficial, may be limited to the scalp, face, neck, and flexor aspects of the extremities, or it may be diffused much more widely. The entire surface of the body may be covered with discrete lesions of this type in cases of unusual neglect or of profound cachexia. The eruption is usually of late occurrence, but in the so-called "galloping-syphilis" of the French it may be precocious in development. The lesions are at the onset nodular or tubercular and become transformed into pus. They have each a deep infiltrated base with a dark-brown halo. Incrustation follows with the formation of a conical, roundish, or oval-shaped, blackish-brown crust, beneath which lies a clean-cut ulcer, the sharp edges of which are usually exactly roofed by the

incrustation. The crust thickens by concretions from the foul and purulent ulcer beneath, and spreads at the periphery while it thickens in the centre. In this way the appearance of the stratified crust resembles that of an oyster-shell, a condition described by some authors as *rupia*, a term once employed as the name of a disease. The ulcer, exposed after removal of the crust, is of characteristic syphilitic type in its deep base, foul floor, clean-cut edges, and purulent secretion commingled with blood, at times attaining a diameter of several inches, and having a circular, reniform, or horseshoe-shaped contour. The degree of destruction it may produce is inversely proportioned to the constitutional vigor of the subject and the treatment pursued. It is usually a grave and may be a malignant exanthem, though under favorable circumstances it is amenable to judicious treatment, and may be an early though oftener it is a late symptom of the disease. The pigmented scars left are characteristic and indelible.

Syphiloderma Bullosum (*Pemphigus Syphiliticus*, an unfortunate designation).—Bullæ in acquired syphilis are late and relatively rare lesions. They are rarely numerous, pea- to large nut-sized elevations of the epidermis, filled at first with a cloudy serum, which soon is transformed into pus, often mingled with blood. They have usually a characteristic halo about the periphery; are roundish or oval in contour; are usually discrete, rarely disseminated; and after development they produce characteristic crusts with underlying ulcers, identical in features with the rupioid sequels of large syphilitic pustules. The eruption is localized by preference upon the extremities, more particularly the lower extremities, and is indolent in its course. It is always significant of a cachectic condition in the subject of the disease and occurs often in the victims of chronic alcoholism who have been infected with syphilis. Its frequent occurrence in congenital syphilis is described later. It is to be distinguished from pemphigus vulgaris by its characteristic crusts and ulcers, considered in connection with the history and associated symptoms of lues.

Syphiloderma Tuberculosum.—In this eruption which may develop within the first year after infection, but which often is deferred much longer, the lesions are usually multiple, flat, roundish, circumscribed, firm, light-red to dull crimson-red nodules, beginning commonly as macules of a lurid hue. They vary in size from that of a coffee-bean to that of a small nut, and involve the entire thickness of the skin, often also the subcutaneous tissue. Their surfaces are smooth, glazed, or desquamating; and their evolution is peculiar in that they rarely exhibit apical pustulation or ulcerative degeneration.

The eruption is, with few exceptions, usually limited to one or more regions of the body, as the forehead, the chin, the nucha, the buttocks, and the outer surface of the thighs. It is less often disseminated than grouped. Occasionally there may be displayed upon the surface of the body but a single tubercular lesion, the recognition of

PLATE XXXIX



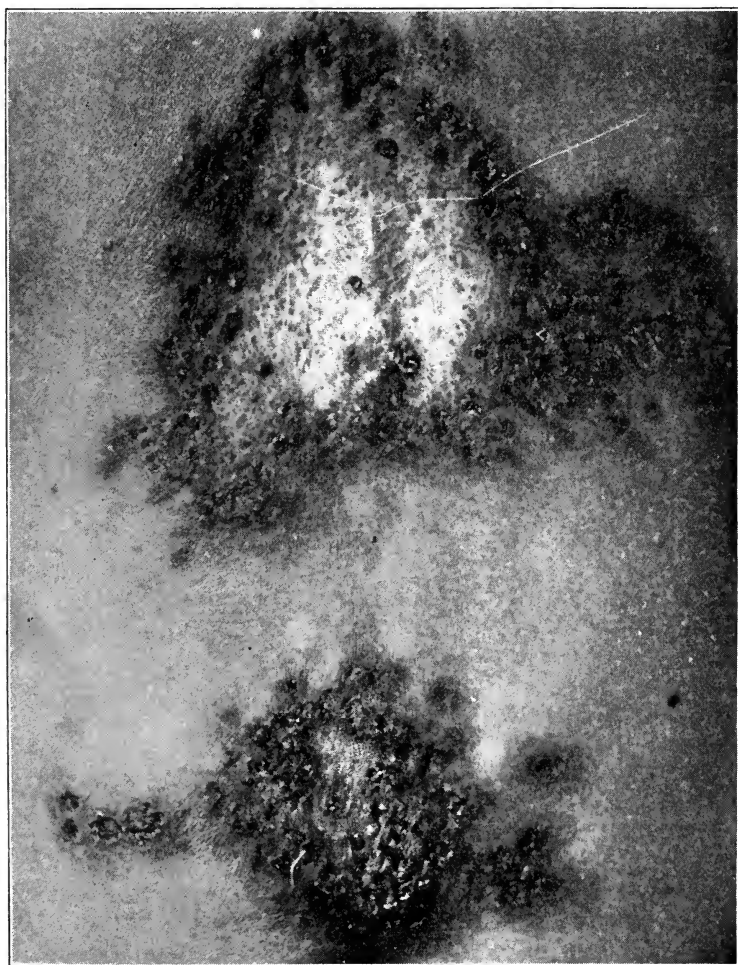
Tubercular Syphiloderm, Resolutive and Serpiginous.



its character usually demanding some skill on the part of the diagnostician. When occurring in groups the typical circinate appearance of the syphilodermata in general may be wanting, the patches having an irregular boundary; but at times the circular, reniform, or horseshoe-shaped outline is distinct, with an enclosed area of integument unaltered or the seat of atrophic changes. Whether resolving by absorption or degenerating by ulceration they commonly leave typical cicatrices of syphilis. There may be complete coalescence of lesions with flattening and necrosis or ulceration at one or several points. At times the lesions assume a serpiginous character and distribution, a condition to which has been applied the term.

Syphiloderma Tuberculosisum Serpiginosum (*Circinate Tubercular Syphiloderm*).—In exceptional cases serpiginous and tubercular

FIG. 125.



Ulcerative tubercular syphiloderm.

lesions are marked by secondary changes. They may become covered on the surface with a thin yellowish crust; may lose their firmness and become soft and rather more lurid red in hue, from colloid, or rarely even suppurative, degeneration; may vegetate luxuriantly and become the seat, especially on the scalp, of warty growths, smeared with a semipurulent secretion of disgusting odor (*syphilis papillomatosa*, *syphiloderma frambœsioides*); or finally they may ulcerate, the superimposed crusts thickening in bulk, deepening into blackish and greenish shades, and covering typical syphilitic ulcerations, with characteristic edges, floor, base, and secretion. The degeneration in the latter case may be rapid and the destruction extensive. This result is, however, of rare occurrence.

The course of the eruption is indolent, months usually elapsing before full evolution is accomplished. In untreated cases there is produced a generalized and symmetrical syphiloderm. It is rare, however, even in hospital and dispensary cases, to observe such development; the more superficial, generalized, and symmetrical are the lesions, the briefer, as a rule, is the interval between such an

FIG. 126.



Gummatous syphiloderm.

eruption and the date of infection. The later the lesions, the more are they asymmetrical, localized, and profound in their involvement of the deep tissues. This syphiloderm rarely appears in the second, more often in the third or fourth, still more rarely in the fifth, tenth, or fifteenth year of the disease.

Resolution occurs by resorption, leaving in the site of the tubercles according to their age, size, and contents, livid and pigmented maculations, or characteristic pigmented, atrophic, cicatriform areas. Scars following the ulcerative lesions are typical in color, shape, and career, the pigmentation of both cicatrix and areola blanching from centre to periphery, and leaving a delicate, dull-whitish, glazed, or slightly desquamating membranous new-growth; ancient relics of this process resembling in appearance thin, small coin- and larger-sized, circular sheets of mica.

Combinations of the tubercles of syphilis with other lesions have given origin to the differing terms employed in the designation of the eruptive phenomena in which the tubercle plays a frequent part. Thus papulo-tubercular, tuberculo-gummatous, papillomatous, or vegetating eruptions are so designated from the admixture of the several elementary lesions recognized in these forms of cutaneous syphilis.

The rarer generalized forms are commonly of simpler type; the circumscribed groups, whether serpiginous or limited to a single

FIG. 127.

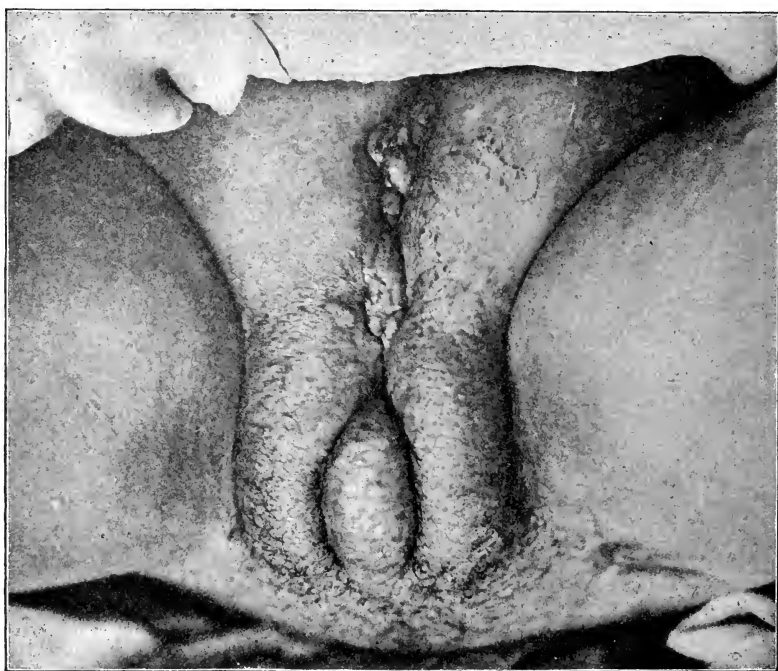


Tubercular syphiloderm.

region are more often variations from type and confusing to the untrained eye. The affected patch, for example, may be coextensive with the surface of an entire limb or buttock; or merely involve the nose and upper lip; or possibly in irregular extension only the face. Whether of the resolute or ulcerative class, the circumscribed patches commonly are sluggish in development and career, often sprinkled with superficially ulcerated points set in disks of atrophic

or scar-formed tissue; or again they furnish a ring of ulceration, deep or superficial, about a healing centre; or a group of well-defined ulcers beset with nodules of papulo-pustular or papulo-tubercular type. The strictly serpiginous patch extends, whether from an ulcerated or partly healed centre, by advancing a ridge of closely agglomerated or fused, papulo-tubercles or tuberculo-gummatous lesions, crusted, ulcerated, or merely resolving by degeneration when treatment has been pursued. The rupioid features seen in the larger pustular lesions are displayed here more rarely and less characteristically. Even in exaggerated types of the serpiginous patches the process in untreated cases is one of advance, repair, ulceration, and

FIG. 128.



Syphiloma of the vulva with gummatous changes in labia and clitoris, and languettes of anus accompanying stricture of the rectum.

scarring in different grades at different points in the same area. It is of striking interest in the study of these cases to note that in almost every instance the disease either has been unrecognized and therefore untreated, or is one occurring in the subjects of cachexia, debauchery, or extreme poverty. Illustrations of these forms of cutaneous syphilis are exceedingly rare among the cleanly and well treated.

The diagnosis is between lupus vulgaris, lepra, epithelioma, acne rosacea, and psoriasis. In lupus the age of the subject, the character of any scars left upon the body-surface, the chronicity of the disease, and the absence of a history of polymorphism, will point usually to the

nature of the disease. The tubercles of lepra are very much more indolent than those of syphilis, and have a characteristic oiled or varnished look, never the livid or dull-crimson color of syphilitic lesions. Set upon the forehead, the tubercles of syphilis, near the line of the hairs, never give the leonine aspect of those at the lower border of the forehead and over the eyebrow of the leper. In epithelioma the age of the subject and the history of the disease are always significant. In the early stage of epithelioma characteristic "pearls" often may be recognized, while the patient may enjoy excellent general health, the imprint of cachexia often being distinct in tubercular syphilis of the skin. In the later stages of epithelioma the ulcer with everted edges and eroded, hemorrhagic floor, "varnished" with a translucent secretion, is totally different from the "punched-out" syphilitic ulcer with its puriform secretion and discolored crusts. The deep infiltration of even the desquamating tubercular syphiloderma distinguishes it from the circular patches of psoriasis. In acne rosacea the telangiectases, characteristic redness, and frequent pustular lesions are suggestive when considered in connection with the absence of ulceration. But, in both sexes, subjects of syphilis, with tubercles limited to the nose and head, in the middle periods of life often present themselves with marked rosacea from spirit-drinking, when the most careful examination is needed to detect the coincidence of the two disorders.

Syphiloderma Gummatosum.—The gumma is a lesion peculiar to syphilis; no other disease exhibits an exactly similar feature. It is usually a late or so-called "tertiary" manifestation of the malady, but like all other symptoms of the disease may be of early occurrence. Gummata occur in two fairly distinguishable forms: the circumscribed, and the diffuse.

Circumscribed Gummata develop as one or relatively few, subcutaneous, strictly circumscribed, firm, well-rounded, painless, and indolent tumors or nodules, which, when first observed, are scarcely larger than a pea. They then are covered with an unaltered integument and are movable.

Very slowly they may, when untreated, increase in size until they attain the dimensions of a marble, of an egg, or even of bodies of a considerably larger size. Sooner or later, when not resolved by treatment, they usually become attached, and the overlying skin is involved, showing by its livid, reddish, or purplish hue and its hyperæmic areola that it threatens to yield. Finally, at one or at several points the skin is so thinned as to be incapable of further resistance, the gumma bursts, and a thick, sanious secretion escapes, the gummy character of which has given the lesion its name. When the inflammation has been active its secretion may be wholly or partially purulent, and in this case be furnished either by the contents of the tumor or by the peripheral tissue which participates in the process. Ulcers always result, which occasionally are fistulous

in type, roundish or oval in contour, with edges clean cut, and floor purulent and extending to the subcutaneous tissue, tendons, aponeuroses, cartilage, or bone. Thin and yielding bands or bridges of undermined skin often extend between several such solutions of continuity, and usually melt down in the presence of the destructive process. When repair is progressing, which is the rule as regards the ultimate result, granulations spring from the floor of the ulcer, the edges contract, and the gummatous eventually exhibits the appearance of a simple ulcer, save in the thinned, purplish, pigmented appearance of the outlying integument. The scars are typical, pigmented at first and bleaching from the centre, and they may be attached to periosteum or bone, though this is exceedingly rare. Considering the depth of the process, the gumma of the skin is, as a rule, succeeded by less evidence of destruction than is threatened at the height of the process. About the neck, cicatrices may be linear in shape and slightly puckered. Upon the extremities and the trunk they are usually circular or oval.

But one gumma may appear upon the person of a single individual, and when this is the case it will usually be found upon the leg; after this region the forehead is most often attacked. Half a dozen or more may at times coexist. In other cases hundreds form. Gummata may develop upon any part of the body, more particularly over the head (face, nose, lips), the thighs, legs, and arms, the scalp, buttocks, and genitalia. When situated over the trunk of a nerve they may become the seat of severe neuralgic pain. They are amenable to skilful treatment, and they may undergo resorption, leaving little or no trace of their former existence.

Diffuse Gummata.—Diffuse gummatous infiltrations of the skin and hypoderm are either distinctly contoured, which is the rule, or ill-defined at the border, varying in extent from a coin-sized patch to an irregularly outlined infiltration coextensive with the integument of an entire limb. The central portion and borders of such an area may be constituted of partly fused originally discrete lesions, as in the instance of papulo-tubercular lesions, or be made up of a thick or thin plate of infiltration, here and there either threatening ulceration or besprinkled with actively ulcerating points. In extreme cases these losses of tissue are deep and vast, furnishing the picture of a group of typical syphilitic ulcers having a sloughy floor and precipitous edge. The patch or patches often form curiously outlined parts of circles in the classical figures of the letter S, the horseshoe-shape, the kidney, etc., these composite groups including equally sized circlets of infiltration with border-ulcers; or a larger central patch with gummatous infiltration is surrounded by smaller patches set circlewise about the former, as in the arrangement of pearls in a brooch. In less classical features there is presented the rare picture of a swollen, engorged, almost elephantiasic organ (leg, vulva, nose), crusted, corded, ridged, knobbed, and seamed with smaller or larger ulcers and scars.

Gummata are to be distinguished from fibrous, carcinomatous, and lipomatous tumors, as also from indurated and enlarged lymphatic ganglia. As gummata of the skin occur in preponderance below the level of the knees, and are for the most part single or relatively few in such situation, by their position alone they frequently can be differentiated from each of the new-growths mentioned, no one of which occurs by preference upon the lower extremities. As they are, moreover, relatively late lesions of syphilis, a history of pre-existing symptoms of that disease usually can be obtained.

The element of time is of chief importance in the diagnosis, as the evolution of gummatous syphilis is more rapid than that of most tumor-forming affections. The characteristic "pearls" of epithelioma and its situation chiefly on the face will serve to suggest the diagnosis when there are gummatous lesions of the extremities. Lupus of the extremities is rare. Gummata of the face are confused most often with the two disorders named above. Invariably in all doubtful cases in the male sex the testicle should be examined, as frequently a tell-tale gummatous infiltration of the epididymis or testicle proper, unrecognized by the subject of the disease, clears up the doubt.

Erythanthema Syphiliticum.—Under this title Bronson¹ described a condition observed by himself in syphilitic patients. Upon a well-defined, crimson or livid, erythematous surface (face, palms, soles) appeared an abundant crop of pea-sized vesico-pustules, which were converted later into an exuding, whitish, elevated, diphtheroid patch. The multiformity of the exanthem was characteristic. In parts it suggested the hydroa bulleux of Bazin; in other parts the dermatitis herpetiformis of Duhring. The fluid exudation that affected the face was not characteristic of the evolution of the palmar and plantar lesions.

Later, warty, papilliform lesions appeared over the face and neck, somewhat resembling secreting condylomata, and surmounting for the most part a dusky-red or erythematous surface.

This author regarded the exanthem as primarily a syphilitic product but not pathologically or etiologically a true syphiloderm. Its origin was possibly similar to that of the angioneurotic, tropho-neurotic, or reflex phenomena of skin-disorders in general, though possibly due to bacterial invasion.

SYPHILIS OF THE MUCOUS SURFACES.

The lesions of syphilis involving the mucous membranes, found chiefly in the mouth, but exhibited, also, in both acquired and infantile disease, over the nasal, aural, vaginal, anal, and balano-preputial surfaces, are strictly allied to the similar symptoms in the skin. The differences are due to maceration of the involved surfaces, to the

¹N. Y. Med. Record, 1886, xxx., p. 253.

functions of the organs chiefly implicated, to contact, and to apposition of contiguous parts.

There is, hence, every grade of disorder from hyperæmia to inflammation; and the results of the latter are both ulceration and cicatrization, each result being subject to the special modifications due to the syphilitic process (gummatous deposits, infiltrations, etc.).

In the purely hyperæmic forms there is usually at the moment or soon after the outbreak of general syphilis a pharyngeal or a pharyngo-nasal blush, spreading symmetrically or irregularly over the parts, accompanied often by engorgement of the tonsils, especially in persons previously subject to disorders of the same region due to other causes (catarrh, follicular tonsillitis, etc.). There is then pain on swallowing, and complications may arise, producing laryngeal hoarseness, cough, dyspnœa, aphonia, nasal discharges, crusts blocking up the passages (especially in inherited disease), and impeding transmission of air through the nares. Similar conditions may be observed about the os uteri, the peri-anal region, and others of the sites named above. This may or may not be the precursor of the severer complications—mucous patches, ulcers, and other symptoms of syphilis of mucous surfaces.

Mucous Patches (*Condylomata*; *Fr.*, *Plaques muqueuses*; *Ger.*, *Schleimhautpapeln*, *Feigwarze*) are merely syphilitic papules occurring in moist situations, flattened by reason of the apposition of affected surfaces and by contacts necessitated by the functions of the parts involved. They form upon all mucous surfaces, but especially in the mouth, where they are the most annoying and the most persistent symptoms of syphilis, complicating both the early and the later stages of the disease.

The patches are roundish or oval, tumid, flattened or very slightly depressed, pale-rosy or whitish spots, moistened with mucus, either developing as such or resulting from hyperæmic plaques of the sort described above, or dispersed among or upon the latter. They often resemble the patches produced on the mucous membrane by pencilling the latter with a crayon of silver nitrate. When carefully inspected, many of them exhibit a loosened and partially detached film of membrane, covering the tissue, beneath which a reddish, raw-looking surface appears. They are seen not merely upon strictly mucous surfaces, but develop also on the verge of the latter (mouth, anus, scrotum), and even on moistened cutaneous surfaces—the edges of nails in infants, and in persons whose hands are often macerated, between the toes, in the vulvo-crural angles, etc. The condyloma is described by many writers separately, but the older authorities were by no means in error when using, as appears above, the term “condyloma” for both the mucous patch and the flattened creamy-looking secreting papules seen often about the anus and the vulva of the subjects of syphilis, particularly those of a tender age; for the condyloma is actually a flattened syphilitic papule, as is the mucous patch, the external appearances of which are chiefly the result of its site and surroundings.

The secretions of these lesions are at times very offensive in odor, especially about the ano-genital region, but also about the mouth and the nose (infants, the filthy, and the neglected). They may become fissured (edges of the tongue, tonsils, vagina), may ulcerate deeply, may be the seat of vegetations (papilloma, so-called "esthiomène of the vulva," etc.), and, in general, may furnish a highly contagious secretion. It is probable that mucous lesions are more responsible for the transmission of contact-syphilis than are chancres.

Mucous lesions are to be distinguished with care from simple aphthous patches in the mouth the result of indigestion or local disturbances; also from smokers' patches (leucoplakia buccalis, "psoriasis linguæ," *leucoplasie*) and from lichen planus of the mouth. In external features these patches may resemble one another, but in only one affection, syphilis, are there other signs of infectious disease. The chief points of difference are: singleness, for the most part, of aphthous sores, and often exquisite tenderness; multiplicity, as a rule, of mucous patches, and much less soreness, though when ulcerated the soreness may be a conspicuous feature. Linear streaks and bands (often quite insensitive) of leucoplastic patches are found especially along the gums, on the lines of the inner cheek representing contact with the approximated upper and lower teeth, and in the pocket posterior to the wisdom tooth. The flattened and often isolated patches of lichen planus of the tongue have an almost characteristic lead-white color.

Scaly Patches ("Papulo-squamous Syphilides"; *Opaline Plaques*; *Mucous psoriasis*) described by most authors separately, are not true mucous lesions of syphilis. They occur not rarely in syphilitic subjects as flattish, smooth, bluish-white or lead-white, firm, slightly indurated, and roundish or highly irregular plaques. They are relatively painless when not the seat of ulceration. They are visible on the dorsum of the tongue, on the mucous lining of the cheeks, and at the angles of the mouth, where they are situated often in part on the mucous surface and in part on the skin of the lip. The thickened epidermis is at times covered with adherent, not readily removed, scales between which fissures form, and the patch, at first almost insensitive, becomes exceedingly tender and painful.

These patches are for the most part of the order described above, that is, leucoplastic, due chiefly to irritation of the mucous surfaces by tobacco-smoke, yet occurring in syphilitic subjects, as they are preceded often by typical mucous patches. They are almost exclusively seen in men. They are also rarely encountered in inherited syphilis. In the distinction sought to be made between the specific and the non-specific form attention is called to the occurrence in the latter class, of hard, uneven, and considerably thickened patches, which occasionally proliferate, and which, extending to some depth, are eventually transformed into epitheliomatous lesions.

Gummatous infiltrations of mucous membranes ("sclerosis of the tongue," of Fournier) occur in both circumscribed and diffused

forms, superficial and deep. In the diffuse superficial forms both the mucous and the submucous tissues are involved in a firm thickening, best studied on the surface of the tongue, which then becomes to the view polished and smooth, at times appearing as if covered with a thin, translucent varnish. Patients exhibiting this condition will often describe a subjective sensation of "slipperiness." These thickenings may involve the deeper structures by every gradation, producing eventually lobulated masses with intervening fissures, tender, raw, and excoriated. The surface of the tongue is then, as a rule, covered with a foul, dirty-grayish coat, and it is occasionally notched at the edge with deep ulcers. At times the tongue is mottled, with patches of redness alternating with the yellowish white of the deposit on the surface of the membrane, and more rarely the tip is covered with florid verrucous filiform growths.

The deeper gummata involve the body of the tongue, and they are felt as submucous, diffuse or circumscribed, dense thickenings (usually tolerably well defined), which soften, ulcerate, and leave exposed to view extensive losses of substance. The floors of these excoriations are deep ulcers, indurated, sloughy, and with membranous shreds over the surface. The fissures of the sides of the tongue described above may here also produce deeply ulcerated notches in the substance of this organ. Deformities of this class are relieved markedly after cicatrization, even when considerable loss of tissue has resulted.

SYPHILODERMA INFANTILE ACQUISITUM ET HÆREDITARIUM.

Syphilis may be acquired by the infant or child at any period after birth, as, for example, by immediate contagion from the nipple of the nurse, or mediately, as by the use of utensils smeared with a secretion capable of transmitting the disease. Such acquired infantile disease displays, for the most part, the symptoms observed in adult years, except that the delicate tender skin at this early period of life often exhibits the moist and secreting lesions of syphilis. The mucous patch, the pustule, and the condyloma are here more common than the papulo-squamous symptoms of the adult. Some influence is also exerted upon the disease by the dress, habits of life, and mode of obtaining nutriment, which are conditioned upon the helplessness of the young child. In this way the soiled napkin over the ano-genital region, the warm covering of, and free diaphoresis from, the general surface of the skin, and the frequent contacts of the lips with the nipple, suffice to determine in special regions particular local expressions of the constitutional vice. The acquired is much less grave in character and portent than the inherited form of the disease.

Hereditary syphilis, which may be displayed first in infancy or in early adult years, is always strictly transmitted by inheritance from one or both parents. The consideration of the disease in these pages being limited to its cutaneous manifestations, it is first to be noted

that the infected fœtus may prematurely be expelled dead-born with cutaneous symptoms displayed upon its body-surface. Over 90 per cent. of the products of conception affected with inherited syphilis perish in abortions.

This condition generally argues in favor either of intense syphilis in one or both progenitors, or, more commonly, of relatively recent infection of both. Under these circumstances there are usually evidences of the death of the fœtus at some date prior to its expulsion, the skin being macerated and the epidermis raised from the corium in few or many bullous lesions, beneath which the derma exhibits a livid reddish or a purplish hue.

When the infant is born with a clean skin it may be shrivelled and emaciated, or be fat and present the appearance of sound health. Soon after birth, however, cutaneous manifestations appear, usually before the conclusion of the first month, less commonly during the second, rarely after the third or fourth. The earlier the date of such explosion the more intense, as a rule, is the evidence of the disorder. The first symptoms displayed are significant of visceral involvement, and are, in brief, those of marasmus. Emaciation progresses rapidly; the skin seems stretched unnaturally over the facial bones; the expression is that of physical distress; the cry becomes a fretful moan; the integument loses entirely the rosy hue of the healthy infant, and acquires instead a sallow or muddy tint; and very peculiar wrinkles or puckered lines radiate from the angles of the lips. Few observers have failed to notice the resemblance which then exists between the faces of these emaciated little creatures and those of the aged of both sexes.

In this complexus of symptoms, however, there is absolutely nothing characteristic of syphilis as distinguished from other wasting diseases of infancy. Chronic tubercular meningitis and the gastrointestinal disorders of infancy in their extreme expression furnish a similar picture. This is natural enough, since all depend alike upon a similar cause: failure of proper performance of function on the part of the viscera in consequence of morbid changes.

The coryza of the syphilitic infant, however, is soon declared, and speedily gives a clue to the nature of the morbid process. The discharge from the nares (at first serous, later purulent) desiccates sufficiently to obstruct the nasal passages or, in consequence of the tumid condition of the membrane lining the passages, is prevented from escaping. Often this discharge is furnished by a specific rhinitis chiefly invading the Schneiderian membrane. At times crusts accumulate externally about the nasal orifices, and they are seen to be similar to those which are prone to form also at the angles of the mouth. In this way the characteristic "snuffles" of the syphilitic infant are induced, in consequence of which it is obliged when nursing to release the nipple from its mouth in order to respire, an act often accompanied by a hoarse cry. The breathing of the syphilitic infant, even when asleep, or awake and undisturbed, is often sufficient to

arouse a suspicion as to the nature of the disease from which it is suffering. The mouth, the larynx, the vulva, and the anus are often the seat of similar lesions, the development of which into an obstructive tumefaction secreting more or less profusely, or into moist condylomata, will largely depend upon the seat and surroundings of the lesion.

The cutaneous symptoms of inherited syphilis are macular, papular, pustular, bullous, or furuncular, two or more of them being at times commingled, attesting thus the identity of the disease with the polymorphic acquired forms of maturer years. Macules early appear upon the trunk, the face, the neck, and the extremities, usually of a livid reddish hue, commingled with papules, and indeed often occur as the first manifestation of the papules. They are irregular as to shape, and though occasionally pinkish, discrete, circinate, and coffee-bean-sized, often produce a diffuse, coppery-red or violaceous, glazed or moist and secreting surface, affecting an entire region, as the neck, the trunk, or the thighs and the genitalia. Often the palms and soles are invaded. Deep excoriations and even fissures occasionally form in these extensive patches, and the secretions may incrust them irregularly, the general aspect of the patch somewhat suggesting an eczematous condition, yet remarkably differing from it in color.

In hereditary as in acquired syphilis the type of all the eruptive symptoms is to be sought in the papules which may spring from the macules described above, and develop into pustules, bullæ, or condylomata; and, in the former case, dull-red or violaceous papules of lenticular size occur either in asymmetrical or symmetrical arrangement, being discrete or agglomerated in patches of infiltration. These papules may, especially upon the buttocks, scale at the apex; or, particularly upon the palms and soles, may constitute by fusion a thickened, desquamating, epidermal patch; or, commonly about the ano-genital region, the interdigital spaces, the axillæ, and face, may become moist and secrete a puriform mucus. By vegetation or by hypertrophy they develop into flat or fissured condylomata, smeared with an offensive, yellowish or yellowish-white discharge; and vary in size from that of a small coin to a lesion a centimetre or more in diameter, with corresponding variation in the degree of their elevation from the affected surface. Condylomata may be few or numerous. Sometimes a child will appear to be well-nigh covered with large, moist, secreting papules. Papulo-condylomata may deeply ulcerate and crust. It should be remembered, in studying these symptoms, that they are those of a cachectic infant affected with a grave disease. Death often interrupts the sequence of the manifestations above described. This event is usually preceded by signs of apparent amelioration, shrinkage of hypertrophic growths, and decoloration of hyperæmic lesions and patches. Of the other cutaneous symptoms of hereditary syphilis, vesicles are the rarest; the smaller, occasionally seen, have a conical apex with serous contents, are closely set together about the lips, and spring from a violaceous infiltrated

patch. The resulting crusts never have the reddish-yellow tint of those observed in eczema, nor, after rupture, are they followed by serous oozing from a wounded epidermis. The larger lesions of this sort are usually transformations of papules which rapidly assume a pustular phase.

Pustular eruptions, in this form of syphilis, may be discrete or be confluent, localized or generalized. They are particularly prone to occur in groups about the mucous outlets, with maculo-papular lesions developed elsewhere, and they may result in ulceration, often after development into bullæ with pustular or sanious contents. The resulting crusts are bulky and dark colored, and, especially upon the face, disfiguring. The subjective sensations are insignificant, since the child does not attempt to tear the affected surface as in pustular eczema. The cachectic condition of the little patient is usually pronounced when these lesions are large and numerous. They may be seen in typical development by the side of the nail, occasionally involving the matrix, and producing in this situation considerable swelling of the digit, with an ulcerative sequel which commonly results in distortion or an ultimate loss of the nail-substance. Onychia, however, may result from perverted nutrition of the part, with increase in the friability of the nail-substance, loss of lustre, assumption of a dirty-grayish hue, and phalangeal œdema. These changes are analogous to those resulting in loss of the hair where the follicles have been improperly nourished.

The furuncles which form in other cases are either exaggerated manifestations of the same pyogenic tendency in the skin of the infant, a complication common to syphilitic and other cachectic conditions in young children, or are the result of infection with pus-cocci. These furuncles may be few or be numerous, and they are characterized chiefly by their indolence, the ill-conditioned pus in their contents, the ulcerative condition left after their evacuation, and the bluish or purplish condition of the integument which surrounds their edges.

Bullæ in hereditary syphilis are early or late manifestations of the disease, and they may be represented by a single lesion on the palms or soles (the site of their predilection), the fingers, toes, or extremities, or they may constitute a symmetrical generalized efflorescence. Bullæ should be regarded as evidences of a grave form of the disease, being often the precursor of a fatal issue, as indicating a feeble resistance on the part of the epidermis to the fluid exudate furnished from the corium beneath. In severe cases the bullæ are ill developed, and the integument will be seen to be marked here and there by small coin-sized and larger disks or plaques of macerated epidermis, separated from the derma by a thin film of serous, sanious, or purulent fluid, in quantity insufficient to raise the roof above the general level of the integument. When fully developed they may be conical, rounded, flat, or flaccid, and be surrounded by an infiltrated border of dark-reddish or violaceous hue. Their color varies with the

color of their contents. In extreme cases they may be distended with blood only. Their subsequent career is concluded by shallow or by deep ulceration, the floor of each bulla secreting a sanious discharge. Crusts may form if the patient survives. A fatal termination of the disease is usually announced by flattening or collapse of the blebs. The lesions may be commingled with pustules, maculo-papules, condylomata, and mucous patches of the anus, the mouth, and the nares; but they are somewhat different from the other lesions described in that they may constitute a uniform efflorescence, no other cutaneous symptoms being manifested. The uniformity is due to the fact that bullæ represent the state of feeblest resistance in the epidermis, the fluid exudate of exceedingly low grade mechanically separating the rete from the tissues beneath.

Tubercles and subcutaneous gummata may develop in hereditary syphilis, but only as late manifestations of the disease, one or more years elapsing before their appearance. Their behavior is scarcely different from that of those observed in the acquired forms, although the destruction wrought by their degeneration in very late manifestations may be of the most intractable type. Usually there is a history of preceding parental or inherited disease, and coincident symptoms or sequels of such disease, in altered teeth (as described by Hutchinson), in an ancient keratitis, or in a hopeless form of surdity.

The special deformity of the teeth first described by Hutchinson involves the *permanent* upper central incisors which when first erupted are short, narrow, and thin, but later, by attrition of the free edge, present a broad shallow vertical notch. The teeth sometimes converge, sometimes are set widely apart and have a dirty hue. These teeth are not, as often has been assumed erroneously, pathognomonic of inherited syphilis, but occur typically in the permanent teeth of children and adults affected with other disorders.

Mucous patches are very constant symptoms of the disease, and they represent papules of the mucous membrane that differ from those seen in the skin only because they are moistened, macerated, and flattened by juxtaposition of neighboring tissues. They are surrounded usually by a lurid halo, and they may have the pearly whiteness always seen when the epidermis of mucous membranes is wholly or partly detached from the corium; or they may lose this protecting disk in shreds or patches, and show, beneath, an engorged or ulcerated and secreting tissue. They may be isolated or be broadly confluent, and be oval, circular, or decidedly linear in shape, the last-named appearance being characteristic of patches existing at the angles of the mouth. Mucous patches are to be recognized as distinct from both the parasitic and the non-parasitic forms of simple stomatitis or thrush, the parasitic form being due to the presence of the *oïdium albicans*. In both of the non-syphilitic disorders the mouth of the child is very generally, uniformly, and symmetrically involved, the circumscribed patches being distinctly discrete and resembling in color soft whitish or yellowish flocculi of curdled milk.

They occur not merely in the mouth, but in the ano-genital region, between the toes and the fingers (especially the former), in the axillæ, groins, buttocks, and folds of the neck.

The diagnosis always is aided greatly by noticing the well-nigh constant occurrence of patches at the angles of the mouth, which has also the seamed and puckered appearance described above. Snuffles, syphilodermata, and marked cachexia, when established, leave little doubt as to the nature of the malady. In all cases when suspicion arises the infant should be stripped of its clothing, its entire surface be inspected carefully; all accessible bones be traversed by the fingers, the shape of the skull studied, and, in the case of male infants, the testes examined for gummatous infiltration.

The future of the infant affected with hereditary syphilis is not always as dark as might be gathered from what has preceded. In this, as in the acquired form of the disease, benignancy may be in rare cases a conspicuous feature of the entire process. The evolution of the disease may be tardy; its symptoms be few and unimportant; its amenability to judicious treatment speedily be demonstrated. Still, the fact remains that the disease when inherited is far graver than when acquired, the victim of inheritance entering the world with its viscera and bones subject to profound pathologic alterations. Attention has been directed to the important fact of the frequency with which the syphilitic product of conception perishes.

Etiology.—Syphilis, in the course of which appear the syphilodermata, is produced by either accidental or intentional infection, or as a result of heredity. In all cases it is believed that the contagium, which reaches the blood through the medium of the lymphatics, is effective by reason of a virus charged with the special germ of the disease or its toxins. The physiological secretions of the infected uncontaminated with pathological products are believed to be incapable of acting as virus-carriers, but, especially in the recently infected, such contamination is of frequent occurrence, and is generally effective in the transmission of the malady to persons not immunized by previous attacks of the disease.

The methods of transmission may be immediate, as in sexual congress, in kissing, and in nursing at the nipple, by which act the child may infect the nurse with the secretion of the mucous patches in its mouth; or the infant may, instead, receive the disease from excoriations on the breast of the nurse. The disorder may also result through the medium of utensils charged with an infectious secretion, such as the needles of the tattooer wet with saliva commingled with diseased mucus, or the lancet of the vaccinator covered with an intoxicated blood. Generally it may be said that all the discharging and moist syphilodermata are sources of danger to a sound individual, both in the acquired and the inherited forms of the disease.

By these and other similar methods persons of both sexes and all ages may become infected.

However begotten, the syphilodermata are yet not excluded from subjection to the long list of external irritants which may in turn annoy the skin. The influence of a hot bath, or the excitement and perspiration in the dance, will often invite to the surface a macular syphilide which might otherwise be less fully developed; friction, as by the hatband over the forehead, the cuff at the wrist, and the shoe upon the foot, demonstrates its influence by daily examples of determination of the morbid process to special localities. In the trades the hands of the syphilitic laborer betray unmistakable evidences of the irritative effect of harsh contacts; the same may be said of filth, such as the feces on the napkin of an infant that frequently provoke condylomata in the anal region. It is a mistake to suppose that syphilis, and syphilis only, is responsible for the exanthemata of that disease in all shades, grades, and situations. Soap and water are as efficient in preserving the skin of the syphilitic as of the sound subject; and the infected tobacco-chewer pays a price for his nauseous habit. Poverty, misery, and wilful neglect or ignorance of the laws of hygiene, are responsible for a long and lengthening list of the complications of the disease.

Pathology.—The search for the micro-organism responsible for syphilis has been conducted by numerous and skilful observers. Beginning with Donn  in 1837, the list includes the names of Hallin (1869), Salisbury and Br hlkens (1870), Klebs, L storfer, Bermann, Cutter, Aufrecht, Obraszow, Lustgarten, v. Niessen, Sch ller, Jullien and de Lisle, Joseph and Piorkowski, and others.

No investigation of the etiology of syphilis, however, has been crowned with the success, now practically amounting to a demonstration, which has culminated in the recognition of the *treponema pallidum*, first described by Schaudinn and Hoffman, as the essential cause of the disease. Since the first publication of the results of their labors the accumulated proofs in confirmation have given rise to a literature including more than four hundred separate treatises and papers.

In a brief summary of the determined facts, it is here merely needful to set down: first, that the new syphilis parasite has been recognized in the enormous majority of all lesions examined by those who have acquired the requisite expertness, in chancres, in early and late superficial syphilodermata of acquired disease; in the cutaneous lesions of inherited syphilis; in the blood; and in many of the internal organs of the body. The *treponema* has been transmitted in generations to the lower animals, more particularly to the anthropoid apes, and has further been recognized in artificially produced lesions of these animals in successive generations. From these, the disease has been transmitted to man as a result of accidental contacts in two conspicuous instances; and in these human cases the delicate spiral organism has been recovered. The practical aspects of this discovery, together with the possibilities now largely discussed among experimenters, as to the possibility of securing a serum capable of relieving

the disease or of conferring immunity against its ravages, are not yet fully determined.

The *treponema pallidum* is a long, helicoid, and mobile parasite belonging to the family of spirillaris, a family consisting of several members which have long been recognized in recurrent fever and other disorders.

The spirals of the spirochæte have an average length of 11.14 microns, with an average number of windings of 10.2, the curves forming arcs of small circles. One extremity is thicker than the other, the thinner and slenderer terminating in what Schaudinn has termed a flagellum. Atypical forms are recognized in which the spirals for some distance in the organism are wanting; others are shorter and thicker; some have distinctly bulbous extremities; yet others are closely intertwined for some distance of the length; again, in cases there are faint indications of transverse division.

The common staining methods are: Giemsa (fixation for ten minutes in absolute alcohol and from one to two hours staining); Goldhorn's borax methylene blue; Wright's blood-stain; filtered solution (saturated aqueous) of gentian violet; iron-hæmatoxylin; and a modification of Levidati's method by silver precipitation (H. Fox). For diagnostic purposes the Giemsa stain is most commonly employed.

The *treponema pallidum* has never been found in non-syphilitic lesions; but is not present in all syphilitic tissue. It is often recognizable in inherited syphilis (viscera, skin, bronchi, bileducts, urine). In the initial sclerosis of acquired disease, it is usually present, as also in mucous patches, enlarged glands, and in the early symmetrical exanthemata. In malignant disease and in late gummata it is more rarely encountered.

Siegel's *Cytorrhcytes luis*,¹ also claimed as the effective agent in the production of syphilis, is much more difficult of demonstration.

The histopathology of syphilis rests upon fewer absolutely distinctive changes than those recognized in other diseases and even than in some other members of the group of infectious granulomata.²

It is believed by Hoffman that the *treponema* obtains access to the general economy through the lymph-spaces of the rete, whence being protected from phagocytosis, it advances to the lymph-vessels of the papillæ. The subsequent changes are in the direction of endo- and peri-lymphangitis with consequent fine new-vessel-formation, connective-tissue hyperplasia, and infiltration. According to Ehrmann, however, the lymph vessels are only secondarily involved, the primary changes occurring in the connective tissue interspaces.

The structural alterations in initial scleroses are: increase of blood-vessels with connective tissue changes in walls; plasma-cell infiltration; involvement of connective tissue; and lastly, secondary

¹ Fischer, Berl. klin. Jour., 1907, Heft 223.

² Recent Literature: Die Aetiologie der Syphilis, Hoffman, Berlin, 1906, with two plates; Fordyce, Vessel-changes and other Histologic Features of Cutaneous Syphilis; J. A. M. A., 1907, Aug. 10, p. 462, with 12 microphotographs; Neisser, Die experiment. Syphilisforschung nach ihr. gegenwärt. Stande, Berlin, 1906.

epidermal involvement (Fordyce). The erosive features of certain chancres are due to central necrosis; in the rare phagedenic chancres the disintegration is due either to the results of secondary infection, to weakened resistance, or to improper treatment. Involution of chancres is by fatty retrograde metamorphosis.

The macular syphiloderm is, according to Fordyce, rather embolic than toxic in character; and the same is true of the papule. The former represents a mild reaction from the encroachment of the treponema upon the distal capillaries of the papillæ, the epiderm remaining unchanged or becoming flattened by compression, with disappearance of the ridge-system. In the upper corium there is moderate vascular dilatation with ensheathment by moderate round-celled infiltration. The adventitia of the larger vessels exhibits a swollen endothelium where are also round and spindle-cells.

The small miliary papule is the result of a follicular process extending from the epidermis into the corium below the hair-papilla. Here also are new-formed vessels in a reticulum about the follicle, which include round-, plasma-, and connective-tissue cells. At the periphery, the vessels are blood-filled; nearer the centre they are obliterated; some become the seat of thrombosis; still more externally the vessel-walls are merely thickened. The coil-glands and erectores muscles participate to some extent in the process.

In the large papular syphiloderm occur parakeratosis, acanthosis, œdema, and development of polynuclear leucocytes with frequent mitoses. The cellular infiltration is limited at first to the vessels in the upper corium.

Between the large papular and the tubercular syphiloderm alike, the distinctions are chiefly connected with the extension of the one morbid process to the relatively deeper portions of the integument. Epithelial hyperplasia, altered blood-vessels, cellular hyperplasia and, in the larger lesions, actually plasma and giant-cells, with lymphocytes and hyperplastic fibroblasts are recognized. The vessels as usual are the seat of an obliterating endarteritis, their former site being indicated by solid cords, groups of irregularly disposed cells with faintly stained nuclei and giant-cells, with peripheral or centrally stained nuclei or both. About the smaller lesions (papules) vessels and coil-glands are embedded in a degenerated connective tissue reduced to a fibrillary net-work, the cellular exudate containing some round and plasma cells.

Vesicles, pustules, and bullæ are of exceptional occurrence in syphilis, being seen chiefly in the very young, in the very old, in cachectic subjects, or as the result of accidental and secondary infection. These lesions form, as a rule, at the apices of papules, and in some cases are caused apparently by an unusual intensity and rapidity of the infective process. Destruction of the cells in the centre of a papule may result in a pustule or superficial ulcer. The coexistence of seborrhœa in some of its phases is responsible for the crusting of many of the papular and tubercular syphilides.

In gummata, the changes are simple extensions and exaggerations of the same process; diffuse infiltration, formation of necrotic foci, vessel-wall thickening, and eventual obliteration. The infiltration consists of lymphocytes, plasma-cells, and many hyperplastic fibroblasts.

Diagnosis.—In seeking to establish a differential diagnosis by purely histological findings, tuberculosis, lichen scrofulosorum, lepra, blastomycosis, epithelioma, and sarcoma are chiefly to be excluded. In blastomycosis and lepra the microscope readily establishes the fact. The lesions of lupus, however, are often difficult of recognition as such. In syphilis, Fordyce lays stress upon the greater degree of proliferating endarteritis and other vascular changes, the incompleteness of the giant-cells, and the rapidity of metamorphosis in both retrogressive and proliferating processes. Of the drug eruptions most liable to be confounded with syphilitic lesions, the most common is that produced by ingestion of bromide of potassium, lesions which the clinician should learn to recognize. In these odd-looking papillomatous lesions, Fordyce calls attention to their remarkable epithelial hyperplasia, the miliary abscesses, and the diffuse infiltration made up of round and polynuclear cells, often with eosinophiles scattered through the derma. The absence of giant-cells and of vascular sclerosis are noteworthy.

In sarcomatous lesions, small-celled growths with interspersed vascular spaces, minute hæmorrhages leaving pigment sequelæ, and numerous mitoses, distinguish the idiopathic hæmorrhagic type; while in other forms, the occurrence of spindle-cells deeply situated in the corium with giant-cells interspersed in a delicate reticulum, commonly suffice to establish the diagnosis.

The syphilodermata are to be distinguished from all other cutaneous eruptions by their general characteristics and by the features peculiar to each lesion. It must not be forgotten, however, that these lesions are not essentially different in character from all others, but are to be recognized with ease or with difficulty according as they do or do not betray the syphilitic expression. No one, however expert in diagnosis, can always trust himself in a doubtful case to recognize these special features by a study of the eruption only, at a given moment of time. Neither in respect to color, form, size, situation, disposition, or other peculiarity do the syphilodermata exhibit an absolute difference from non-syphilitic affections of the skin. It is, therefore, requisite in every case to investigate in the fullest manner the history of the disease, of all prior skin-lesions, of a primary sclerosis (when this can be obtained), of adenopathy, miscarriages, abortions, and disorders affecting other organs of the body, as the bones, the viscera, the organs of sense, and the mucous surfaces. Often a single extra-cutaneous symptom is a valuable aid in establishing the diagnosis of syphilis. An "eczematous" infant with snuffles and a hoarse cry has been treated in vain by many a physician, otherwise capable of making a diagnosis, who might have been given a clue to

the nature of the disease from which the child was suffering if he had taken pains to inspect the anus and question the father in private. It is especially noteworthy that syphilis is very rarely a disease with cutaneous symptoms only. The bones, viscera, testes of male patients, and mucous membranes rarely fail to give evidence of systemic infection when lues has existed for any length of time with active cutaneous manifestation.

The distinction between syphilis and yaws¹ is of importance in the countries where the last-named disease is relatively common. Yaws, unlike syphilis, acknowledges a special topographical habitat; it is in general not of venereal origin, often attacking children but in infants never before the twentieth or thirtieth day after birth; its incubation period is variable; there is no constant primary lesion; the characteristic yaws symptoms are conical elevations of the surface with an erythematous ring at the base; there is no alopecia, no involvement of mucous surfaces, no iritis, and no visceral lesions. Lastly the victim of yaws may incur syphilis. Both disorders are produced by a variety of spirochæte; yaws by the spirochæte pallidula.

Every syphilitic patient with a disease of the skin does not necessarily exhibit syphilodermata. The course of the disease in many cases is so protracted that patients have ample opportunities to contract other disorders, and their number is larger than is commonly supposed. They suffer most often from the medicamentous eruptions, especially those induced by the ingestion of potassium iodide (cf. the chapter on Dermatitis Medicamentosa: Drug-eruptions from Salts of Iodine); they are, like other men and women, bitten by bugs and lice; and they suffer from eczema, acne, psoriasis, and other non-venereal disorders. This common susceptibility is less true possibly of the innocent victims of the disease than those guilty of sexual excesses in and out of the married state, many of the unmarried leading the most disordered lives, and exposing themselves to the ordinary causes of disease to a degree not noted in other persons.

It is always necessary, therefore, in making a diagnosis in a case supposed to be syphilitic, first, to determine *ab origine* the fact of syphilis; and, if that fact cannot indubitably be ascertained, to be careful that the statements of the patient are not allowed to bias the judgment in pronouncing upon any eruption present; second, supposing that such a fact is established by clinical proofs without reserve, to decide whether the eruption present is produced by the existing syphilis or some other externally or internally operating cause; and if this last be determined, to be careful in eliminating the syphilitic influence from its operation.

Ignored syphilis is usually severe; but it is without avail that disorders of a different character are treated by the methods useful in syphilis. Thousands are annually thus mistreated who might have been spared such a calamity. The frequent occurrence, after a suspicious exposure, of a balanitis, of an attack of progonital herpes, of

¹ Beurmann and Gougerot, Rev. de Méd., 1907, May 10.

uninfected excoriations, of blennorrhagic discharges, and even the appearance of molluscous tumors, warts, or parasitic cutaneous disorders upon the genital region, is a source of alarm and of fruitful error to the many rather than to the few.

The diagnostician none the less must ever be on the alert to recognize the symptoms of the disease in those who least suspect it. Thus, married women complaining of a "humor of the blood," men who have been "overheated and broken out with a rash," and a long list of patients exhibiting upon their persons the symptoms of "salt rheum," "lupus," "tetter," "scrofulous ulcers," and "erysipelas" are those whose speedy relief will depend upon the skill of the practitioner in recognizing the precise nature of the malady.

The diagnosis of syphilitic lesions of the skin is a matter of the very greatest importance, inasmuch as the health, comfort, mental happiness, and domestic relations of thousands of men and women annually depend upon it alone. An error in either direction may involve the most serious consequences to both physician and patient. He is but poorly qualified to discharge the important duties of a general practitioner of medicine who has not carefully trained himself to establish the truth in these cases, irrespective of the diagnosis of the patient and of all others who may have been consulted.

Serum Tests.—The diagnosis of syphilis by serum tests requires special skill in the management of its technical details as also access to much clinical material. The test elaborated by Wassermann, Neisser, and Bruck,¹ and by the same experimenters in connection with Schucht² is conducted as follows:

An extract is prepared with salt solution from the organs of a syphilitic fœtus to which is added a small quantity of the spinal fluid of the suspected person heated to 56°C. with a view to destruction of what is known as its "complement," the latter being later provided by serum from a normal guinea-pig. After exposure for one hour in an incubator, the syphilitic antibodies in the spinal fluid (if these be present) combine with the treponema substance of the extract, and unite with the complement derived from the freshly added serum. There is left no free complement; as shown by removing a small amount of serum from an animal immunized against the red corpuscles of another of its kind, heated to 56° C. and mixed with the supposed syphilitic mixture. If the complement of this mixture has been all combined by the syphilitic antibodies, the heated hemolytic serum has not been activated, and has no power to hemolyze red corpuscles.

The Wassermann test is fully described by Fleischmann and Butler,³ and endorsed by them after careful experimentation, as also by Hoffman and Blumenthal,⁴ Finger,⁵ and others.⁶ Yet the equally

¹ Deutsch. med. Wochsft., 1906, xxxii., 745.

² Zeitschft. f. Hyg. u. Infektionskrankh., 1906, lv., 451.

³ J. A. M. A., 1907, xlix., Sept. 14, p. 934.

⁴ Derm. Zeitschft., 1908, xv., p. 23.

⁵ Wien. klin. Wochsft., 1908, No. i.

⁶ A practical modification of the Wasserman test has been devised by Noguchi: Jour. Exper. Med., 1909, xi., p. 391.

careful work of Wollstein and Lamar¹ has led them to the conclusion that "neither by the complement-binding method, nor by the method of precipitation as at present carried out, is it possible to show the presence of antagonistic substances in the blood-serum of patients in the secondary stages of syphilis, on the one hand; and in the tertiary stages of syphilis on the other; or in such parasyphilitic affections as tabes and paresis." The prospect that an absolute determination of the period when syphilis no longer has left traces of its existence in the system, is still clouded with uncertainty.

Treatment.—Metchnikoff's formula for the prevention of syphilis is 33 grains (2.) of calomel, added to 67 (5.) of lanoline and 10 (0.66) of vaseline. The ointment is claimed to be effective only when thoroughly rubbed into the infected region during the first few hours after exposure, but experiments on monkeys have demonstrated that a single injection of atoxyl, employed at any date before the fifteenth day after infection is capable of preventing the occurrence of the disease. Prophylaxis in man is claimed to have been secured by two injections of atoxyl of ten grains (0.66) each at intervals of two days. In these cases, however, there was simply a dread of infection and no conclusions can be drawn from the experiment.

The syphilodermata are to be treated by topical applications intended to hasten their disappearance or involution; but as local manifestations of a constitutional disease, their management is largely that which looks to the relief of the latter.

The treatment of syphilis, in the pages which follow, is described in outline, so far as it relates to the relief of cutaneous lesions and of the systemic condition. The important modifications of therapy that are required in the management of syphilis of the osseous and the nervous systems, of the respiratory, gastro-intestinal, and other organs, it is scarcely necessary to remark, are fully described in the standard treatises specially devoted to this subject. Among them may be named, as of American authorship, the works of Taylor,² of Morrow,³ of Keyes,⁴ of Hyde and Montgomery,⁵ of White and Martin,⁶ and of Bangs and others.⁷ Of those more or less recently published abroad may be named Power and Murphy's System of Syphilis,⁸ the standard treatises of Jullien,⁹ of Fournier,¹⁰ of Diday and Doyon,¹¹ of Mauriac,¹² of Neumann,¹³ and of Lang.¹⁴

¹ Arch. of Intern. Med., 1908, i., p. 314.

² Pathology and Treatment of Venereal Diseases. Philadelphia, 1900.

³ System of Genito-urinary Diseases, Syphilis, and Dermatology. New York, 1893 (3 vols.).

⁴ Surgical Diseases of the Genito-urinary Organs, including Syphilis. New York, 1888, and E. L. Keyes, Jr., N. York, 1908.

⁵ Syphilis and the Venereal Diseases (2d edition). Philadelphia, 1900.

⁶ Genito-urinary Surgery and the Venereal Diseases. Philadelphia, 1897.

⁷ American Text-book of Genito-urinary Diseases, Syphilis, and Diseases of the Skin. Philadelphia, 1898. Cf. also a recent and valuable paper on the Treatment of Syphilis, by George Pernet, B. M. J., 1907, Mar. 30, p. 730.

⁸ Six vols., London, 1908.

⁹ Traité pratique des Maladies vénériennes. Paris, 1886.

¹⁰ Leçons sur la Syphilis, etc. Paris, 1873. La Syph. Héréd. tard., 1886.

The first and often the most important consideration for the practitioner who is in face of a syphilitic patient is the care of that patient's general health. Simple and natural as it may be to set down such an injunction in this connection, its importance rests upon the fact that it is too often neglected. Patient and physician respectively are often hurried into the precipitate ordering and swallowing of specific drugs without regard to other as important details.

It is well to hand to the patient, at the outset of all treatment for syphilis, a slip of paper on which are printed in concise and simple terms a set of rules to be observed during the continuance of the disease. For physicians who do not take similar precautions it is advisable to enter rather fully into the explanation of certain details which the patient should be made to understand.

He or she, if an adult, should, as a rule, be informed of the serious nature of the disease recognized, since every infected patient has an interest in knowing this fact, and its important bearing upon his or her relations to the uninfected. To every such patient, with the assurance that the disease is often benign and productive of little discomfort and in any case is curable, it should be stated that the affection is contagious and capable of transmission to sound persons by physical contacts of various characters. The patient should be instructed as to the nutritious character of the diet he should select, and should be informed that an increase in body-weight while subjected to treatment is decidedly favorable in the matter of prognosis; that the starving and sweating processes so highly esteemed by the charlatan and the advocate of the virtues of the waters of certain resorts are relics of antiquity, as useless in fact as they are frequent sources of peril.

The bathing of the body is a matter of importance. Hot, Turkish, and Russian baths, as a rule, are to be interdicted, inasmuch as they tend to invite cutaneous hyperæmia, and thus to favor the occurrence of eruptions. Cool or tepid baths are to be employed sufficiently often for the purpose of cleanliness, and by the sponge rather than by immersion. Dry friction daily of the surface of the body may be ordered with advantage where the skin is still sound. The teeth, the mouth, and the gums require constant care. The use of the tooth-brush with cool water twice daily is a matter of importance, and the brushing should be preceded for a time, when the gums at the outset are in a tender, fungous, or hemorrhagic state, by gentle friction with the finger, covered by a handkerchief dipped in a weak spirit-and-water lotion, to which tincture of cinchona and of myrrh may be added in any desired proportion. Tobacco in every form is decidedly injurious. Often the patient should be sent to a competent

Traitement de la Syphilis. Paris, 1895. Les Chancres extra-génitaux. Paris, 1897. Traité de la Syphilis, tome i. Paris, 1898-99.

¹¹ Thérapeutique des Maladies vénériennes. Paris, 1876.

¹² Leçons sur les Malad. vénér. Paris, 1883 and 1895.

¹³ Syphilis. Vienna, 1896.

¹⁴ Vorlesung über Pathol. u. Therap. d. Syphilis. Wiesbaden, 1896.

dentist for the extraction or the filling of carious teeth, and for the removal by the file or the dental engine of all sharp, projecting edges.

Malt liquors, wines, and spirits should be employed solely under the explicit direction of the physician. They are exceedingly useful in debilitated subjects of a certain class, and need not be prohibited *in toto* to those long habituated to their use. At the same time, an improper use of these stimulants is in the highest degree harmful. When employed at all, they should be restricted rigidly to the dining-table and the hours of meals.

A compliance with the laws of hygiene is even more requisite for the syphilitic than the non-infected. Fresh air, social amusements, exercise, the regular routine of business life, or, when this has proved exhausting, the recreation of travel—the claims of all these need at times to be urged by the physician. With this the patient should be encouraged to free his or her mind from needless anxiety, and to avoid particularly the company and conversation of those similarly infected, whose opinions are based too often upon ignorance or upon a knowledge of half-truths. The literature of syphilis, for a similar reason, is to be eschewed, as a mass of patients, too many of whom purchase treatises on the subject, are able only imperfectly to glean the meaning of the authors consulted.

It should be a rule to urge a married patient to inform the conjugal partner frankly of the fact of infection, for the sake of both. When this advice is followed much future trouble is avoided, and one of the obstacles to a completely favorable issue is at once set aside. Instances occur in which disruption of the conjugal bond results from infection of one, but usually of both parties; it is a striking argument, however, in favor of the policy here urged, that cases are rare in which a frank and honorable confession has been followed by separation. It may be added that in the “confessed” cases there is rarely subsequent infection of the innocent. The larger number of married patients are husbands. Recently infected young adults who have contracted a marriage-engagement should invariably claim release from such a tie for the sake of all concerned. The syphilitic wet-nurse must at once be taken from the sound nursing, and the child with hereditary syphilis must be suckled only by its mother, who, according to Colles’s law, the exceptions to which are so few as to prove the rule, always enjoys immunity against the diseased mouth of her own child.

Respecting the medicaments employed in the treatment of syphilis, there is no routine plan which in every case can advantageously be followed. In no respect do physicians so differ from each other, judged by the standard of professional skill, as in their ability to use a single remedy with success. He who has the largest armamentarium is not always either the best equipped or the most successful. Mercury, iodine, iron, and quinine are the great remedial agents in syphilis, but they may vainly be used by one man in the long effort to accomplish that which another speedily and brilliantly achieves by the use of the same remedies employed with greater skill.

Of the other substances vaunted as either advantageous or specific in the treatment of the disease, no one possesses any claim whatever to the confidence of physicians. Sarsaparilla, dulcamara, stillingia, guaiacum, tayuya, mezereon, and the long list of other vegetable preparations whose virtues have thus been extolled, are for the most part as harmless in themselves as they are ineffectual for the relief of the malady.

Before proceeding, however, to assume the responsibility of directing a course of treatment for syphilis with remedies of acknowledged value, the physician will do well to remember that no two cases of the disease are precisely alike, and that there is the widest range between the most benignant forms encountered in private practice and the malignant cases seen in hospital-wards. Some forms of the malady are so mild as to constitute merely an inconvenience; others are so severe as to destroy life. It is an axiom in venereal disease that more patients perish annually from blennorrhagia and its results than from syphilis. There could be no greater error than to treat by a uniform method any disease exhibiting so wide a variation in severity.

Mercury, after the assaults upon it of generations of men of admitted wisdom and candor, stands to-day unrivalled as a remedy for the relief particularly of those stages of syphilis in which the skin is involved. Administered with skill, it can be employed for years with advantage to the syphilitic patient, who, during a well-regulated mercurial course, should gain in weight, improve in vigor, and exhibit a healthy color of the skin. The sinking of the hæmoglobin recognized by Justus¹ after a mercurial course is now known to be followed by a restoration to the normal level. No competent physician to-day employs mercury in such a manner as to induce salivation or other toxic consequences. Such effects of the remedy result from carelessness or ignorance. In every discussion of the merits of mercury in syphilis both physicians and patients have been guilty of the ignorance or the folly of ascribing to the remedy the disastrous effect of the disease.

Mercury may be given by the mouth, by inunction, by subcutaneous injection, or externally by the aid of the vapor-bath. The most popular method, and that productive of least inconvenience to all concerned, is the method by ingestion.

INGESTION.—In this mode of treating syphilis the mild chloride, bichloride, bicyanide, blue mass, or tannate of mercury may be employed effectively. English practitioners as a rule prefer to all others the hydrargyrum cum cretâ, given in one grain (0.06) doses three times daily. These preparations, however, are rather less adapted than others for continued employment during long periods of time, and are open to the objection of either readily undergoing rearrangement into more stable compounds of the metal, or of producing undesirable irritative effects. With the protoiodide and the biniodide an impression can be produced upon the system that can readily be

¹ Int. Cong. of Derm., London, 1893, p. 1756.

proportioned to the exigencies arising in every case, which can be sustained during that "chronic medication" which Fournier declares to be requisite in every chronic disease, and which can be exerted without fear of immediate or of remote deleterious consequences.

Treatment of syphilis by the mercurial selected for use should, as a rule, be begun only at the moment of evolution of constitutional symptoms. The initial sclerosis of the disease is amenable to the action of the metal to a remarkable extent, but in a large proportion of cases the chancre will cicatrize, when in an ulcerative stage, without having recourse to general medication. Early mercurial medication may well be reserved for such primary lesions as are threatening in symptoms, and for such individuals as require or demand speedy cicatrization of their chancres, as, for example, those about to travel beyond the reach of medical assistance. Personal experience fully confirms the wisdom of the teaching which reserves specific medication until the second period of incubation has passed. No local or general treatment can avert either a mild or a severe explosion of symptoms after that period is completed. In experiments made to determine this question of delay there has been either the production of strikingly irritative effects, such as a marked relapse, or unusual increase in the volume of the initial sclerosis immediately before the evolution of the first syphilodermata, or a distinct obstinacy in the latter to the action of the medicament employed.

In the early stages of syphilis in adults the mercurous iodide may be named as one of the most trustworthy preparations. Of all classes of adult patients, including strong men and adult women, there are scarcely 2 per cent. who cannot take it, if the dose be proportioned to individual susceptibility. It is usually administered in pill or in tablet form in doses of $\frac{1}{8}$ (0.01), $\frac{1}{6}$ (0.013), $\frac{1}{4}$ (0.016), or $\frac{1}{3}$ (0.022) of a grain, three times daily, combined with the extract of gentian. The dose may be increased gradually according to the necessities of the case, from $\frac{1}{2}$ (0.033) to 3 (0.20), and even 4 (0.266) grains in the twenty-four hours. Many of the gelatin-coated pellets found in the market contain accurately divided doses of the salt. The sugar-coated pills of Garnier and Lamoureux, containing each 1 centigramme of the protoiodide, are efficient and largely employed.

Beginning with a minimum dose, this remedy is to be steadily exhibited, and the daily quantity consumed to be gradually increased until the degree of tolerance of which the patient is capable has been ascertained. Should the stools become frequent, pain be excited, or a slight effect produced upon the mouth, as indicated by a metallic taste, moderate increase in the quantity of saliva, or any noticeable degree of tenderness of the gums, the dosage is to be gradually diminished until these symptoms disappear. Often the withdrawal of $\frac{1}{2}$ (0.033) or $\frac{1}{6}$ (0.013) of a grain daily will suffice to enable the patient to tolerate the quantity thus diminished. The medication is to be faithfully continued until the object in view is obtained, viz., relief of all symptoms of the disease.

In the "tonic treatment of syphilis" the dosage is increased only on each third or fourth day, until irritative effects are produced, when, after an interval of two days, the quantity taken at the time of the production of such effects is reduced from one-half to one-third. This reduced quantity is termed the "tonic dose," and is thereafter continued throughout the treatment in "nearly all conditions of health or disease."¹

No case of syphilis can be said to have been treated properly in which iron has not been given for at least a part of the time during which the patient was under observation. Ferric citrate with quinine is an excellent preparation administered at the meal-hours, in a small quantity of sound sherry wine; or ferrous iodide may be employed in syrup, or in pills made after the formula of Blancard, or in Vallet's mass. In some cases tincture of ferric chloride may be employed, but the physician should be careful about ordering an acid preparation during a mercurial course. There is no form of anæmia which responds more promptly to the chalybeates than does that produced by the syphilitic virus.

The mercuric iodide may be substituted for the mercurous iodide when, for any reason, it is thought desirable, beginning with a minimum dose of $\frac{1}{64}$ grain (0.001), and increasing this gradually to $\frac{1}{40}$ (0.0016), or rarely to $\frac{1}{20}$ (0.0033), either in pill or in solution. The average dose of $\frac{1}{40}$ (0.0016) of a grain in pill-form, administered three times daily, soon after eating, is tolerated by the majority of all patients of both sexes without consciousness of unpleasant effects.

Calomel may be administered in 1 or 2 grain doses (0.066–0.133) three times daily, in combination with an opiate to prevent its action on the bowels, or in $\frac{1}{10}$ grain dose (0.0066) every hour. Small doses of blue mass or of gray powder may also be employed. The gray powder is most suitable for children and infants, but since the discovery in the drug of the corrosive chloride, either as of early or of late chemical production, the gray powder is esteemed less. The decimal trituration of calomel with sugar of milk is a far more suitable compound. Corrosive sublimate, in doses of from $\frac{1}{20}$ (0.0033) to $\frac{1}{12}$ (0.005) of a grain is exhibited in pill-form or in solution, and probably is employed more generally in the treatment of syphilis than any other mercurial salt. The objections to its use are suggested above. Though constantly employed in public charities, where it is furnished as a cheap and a convenient substitute for the more elegant preparations in the market, it is ordered much less frequently for syphilitic patients in private practice. When given in solution it produces a disagreeable metallic taste in the mouth that some patients can perceive after the lapse of hours.

With many physicians of experience it is customary to employ opium, either alone or in connection with the use of mercury, for the

¹ Amer. Jour. Med. Sci., 1876, xevii., p. 17; Phila. Med. Times, 1882, xii., p. 337.

relief of ulcerative or other lesions of syphilis. Sometimes it is employed for the purpose of relieving pain, sometimes to prevent the cathartic action of the metal upon the bowels, and again because it is supposed to possess some power of arrest over the destructive action of the disease. It should not, as a rule, be exhibited when by reducing the mercurial or exchanging the latter for a ferruginous dose the same result can be reached. Few syphilitic patients are in the end brought to the desired termination of the disorder by the use of a remedy which interferes with assimilation and digestion. Temporary advantage often is gained by its employment, but this may be more than counteracted by its ultimate effect upon the gastro-intestinal tract.

INUNCTION.—Mercury is introduced satisfactorily by the method of inunction. The metal when thus employed is absorbed readily by the system, and its therapeutic value is great. Inunction should be employed in every case which admits of it, since the gastro-intestinal tract thus is left undisturbed, and, further, the dose of any needed chalybeate or of potassium iodide by the mouth can be regulated without increasing or diminishing the quantity of mercury in daily use. Mercurial ointment compounded with lanolin is used best for this purpose. Cleanly but less efficient substitutes for it are provided in the oleate of mercury in the strength of 10, 15, or 20 per cent., and in the vasogen capsules. From $\frac{1}{2}$ to 1 drachm (2.-4.) of either the ointment, the vasogen compound (the mercury-vasogen capsules contain about 33 $\frac{1}{3}$ per cent. of the metal) or the oleate may be rubbed into the skin at night before retiring, and the part selected for inunction be cleansed by washing in the morning. Unna for this purpose praises the mercury-salve soaps. All these preparations, if continually applied to a single portion of the skin, are liable to produce a mild local dermatitis, hence it is wise to select on successive evenings a fresh portion of integument for the local application, preferably that where the epidermis is relatively thin, as, for example, the flexor aspects of the joints. The patient can thus upon one evening anoint the inner faces of the thighs; upon the next, the sides of the chest; upon another, the loins, etc., taking care to avoid surfaces where an induced dermatitis is likely to prove especially annoying, such as the scrotum, the axillæ, and the groins. The ointment in some cases may be well rubbed into the soles of the feet previously soaked in warm water, after which the socks or stockings may be drawn over the feet for the night. Often the ointment may be applied, as advised by Welanders, spread on cotton, wool, or linen, and worn over a limb or the surface of the chest. In the case of infants the inunction is well performed by the natural movements of the child, if a flannel swathing-band previously smeared with the salve be wrapped about its belly, so that the mercurial preparation is kept in contact with the skin. Should local irritative effects be produced, these subside rapidly as a rule after a warm alkaline ablution followed with a bland dusting-powder. Subsequently or even before such accident in the case

of infants or of patients having unusually sensitive skins the mercurial salve may be mixed with equal parts of lanolin, lard, or olive-oil. As some patients become disgusted with this routine, it is well at the onset to flavor the substance selected for inunction with lavender, rosemary, or bergamot.

Too little attention has been attracted to the treatment of syphilis by mercurial inunction. With this fact in view the preceding paragraphs which describe the use of mercury by the mouth are to be understood as related in all cases to the employment of the metal by the skin. It is well to order inunction in all practicable cases; to save the stomach as much as possible; to continue with the mercurial ointment nightly, weekly, or less frequently, so long as there is a possibility of relapse; and to adjust carefully the quantity employed to the exigencies of the case. In this manner patients may be relieved of all symptoms of the disease who have not during their treatment swallowed a dose of mercury, and the permanency of whose relief may be tested during years of subsequent observation.

FUMIGATION.—One of the most effective methods of administering mercury is by fumigation in the vapor-bath. It is employed by many experts as the sole means of exhibiting the mercurial selected for use, but it is, for the average patient, too inconvenient for continuous employment. It should regularly be ordered, first, in all cases in which the earliest syphilodermata are intense, generalized, and particularly conspicuous upon the face; second, in all obstinate cases in which the patients are not women nor cachectic subjects of either sex; third, at the outset of treatment of many "ignored" cases in which the syphilodermata, either more or less generalized, have proceeded to uninterrupted evolution; fourth, in the severe cases of patients coming from the country to the city, who are able to remain but a brief time within reach of advantages offered in metropolitan centres. From $\frac{1}{2}$ to 1 drachm (2.-4.) of calomel, metallic mercury, the bisulphuret, the black oxide, or hydrargyrum cum cretâ may be employed for each bath. It is common to order 1 scruple to 1 drachm (1.33-4.) each of calomel and cinnabar. The patient is stripped of his clothing and seated in a chair, the patient and chair being completely enveloped in blankets, which are closely fastened at the neck of the bather. Beneath the chair is an alcohol lamp, surmounted by a metallic vessel containing water in ebullition, the hot vapor of which in a few moments induces copious perspiration. • When this result is obtained the lamp is brought beneath a metal plate containing the substance to be volatilized. The patient remains exposed to the vapor about ten minutes after this process of sublimation is finished, and retires at once to bed without cleansing the skin, the fumigation preferably being conducted before the hours of sleep. In the morning a bath may be taken for the purpose of cleanliness. It is convenient in the generation of the vapor in this way to make use of the Schering or other fumigating lamp, but the materials requisite for the production of all desired effects, with the exception of the

alcohol lamp and the drug, can be procured of any skilful tinsmith. In the city male patients are often sent to bath-houses, where the fumigation is conducted in the daytime; and, as a consequence, they rarely experience unpleasant effects, such as are popularly associated with "taking cold" after exposure to the action of mercury. In most of these establishments provision is made that the head also can be exposed to the mercurial fumes, respiration being conducted through a tube in connection with pure air, a provision useful in certain cases of emergency; and only "emergency cases" should be required to resort to fumigation of the head.

Audry (cited by Pernet) has also employed mercury, by introduction of 40 per cent. suppositories of gray oil into the rectum.

SUBCUTANEOUS INJECTION.—This method, which was first advocated by Scarenzio¹ in 1864 and popularized by Lewin,² has been extended largely since its acceptance as a scientific procedure.³ It is efficient and speedy, but will probably always find largest favor in the treatment of hospital patients, who are completely subject to the orders of their medical attendants. In common with some of the other methods employed, injection provides for the exclusion of the medicament from the gastro-intestinal tract, and accomplishes the desired effect with a minimum and exactly mensurable dosage. The objection to its systematic employment outside of hospitals is the need of a physician or an expert to administer the dose. The injection of mercury into the deep muscular tissue (the gluteus in its thickest part with the muscle wholly relaxed; the trapezius above the upper scapular angle with equal lack of tension), as well as when practiced more strictly hypodermatically, requires all antiseptic precautions both as to the point where the needle is inserted and as to the instrument itself. These injections occasionally have proved fatal (calomel, gray oil); grave mischief has followed in several instances from visceral troubles; and the attacks of syncope which result in certain cases from these injections have presented alarming and even dangerous features.

The technique of mercurial injections is of importance. A syringe of the capacity of not less than 2 c. ctm. should be constructed wholly of glass and armed with irido-platinum needles. The operation is conducted with strict aseptic precautions, the patient, when intramuscular injections are employed, preferably lying prone, though other postures are advised. The needle is plunged vertically into the deep part selected—post-trochanteric fossa (Smirnoff); intersection of a horizontal line two finger-breadths above the great trochanter and of a vertical line separating the inner third of the buttock from the outer two thirds (Galliot); or, the middle of a line con-

¹ Trans. Int. Derm. Congress, London, p. 376.

² Die Behandlung der Syphilis mit subcutaner Sublimat-injection, Berlin, 1869; also translated by Proegler and Gale, Phila., 1872.

³ Gottheil, W. S., Ten years experience in the treatment of syphilis by intramuscular injections of insoluble mercurials, Jour. of Am. Med. Ass., 1907, xlix., p. 365.

necting the anterior superior spinous process and the base of the coccyx.

Corrosive sublimate, $\frac{1}{12}$ (0.005) or $\frac{1}{8}$ grain (0.008), dissolved in 10 or 15 minims of distilled water may be injected at a time, the operation being repeated upon about twenty occasions. Bamberger, of Vienna, reported favorable results after the injection of an albuminate or a peptone of mercury, thus attempting to avoid the danger of localized abscesses, and insuring speedy absorption of the metal. All formulæ, however, proposed for preparation of solutions of this character have proved imperfect, both in consequence of failure to obtain a pure metallic albuminate, and also from lack of permanency in the solution. Staub's formula, the result of experiments made by Hepp,¹ may be taken as a sample of the rest:

R	Hydrarg. chlorid. corros.,	gr. xvijj;	1 20
	Ammon. chlorid.,	gr. xvijj;	1 20
	Sod. chlorid.,	5j;	4
	Aq. dest.,	fʒiv;	120 M.
Dissolve, filter, and add the white of one egg in distilled water sufficient to make ʒiv (120.); 15 minims of the solution contain about one-twelfth of a grain (0.005) of the sublimate.			

Hallopeau² and Scherwer³ conclude that injections according to the method devised by Paul Salmon, of the anilarsinate of sodium ("atoxyl") are equal if not superior to the action of the two chief remedies employed in the treatment of syphilis. He admits that treatment by these injections may be accompanied by intestinal pain, nausea, malaise, vomiting, and dysuria—conditions often requiring cessation of the treatment. Ten per cent. injections in the buttock, from 50 to 75 ctmgs. at a dose are successively employed at intervals of from two to four days. Usually from five to eight injections suffice. Some seventy-five patients were thus treated at the St. Louis Hospital. Metchnikoff and Salmon believe that their experiments demonstrated the abortion of syphilis in monkeys thus treated. Puckner and Clark,⁴ however, have shown that the recommended dosage of atoxyl is but one and one-half times as great as the advised dosage of arsenic in Fowler's solution though the claim has been made that it contains "forty times as much."

Other preparations may be employed for hypodermatic injection. When insoluble salts of mercury are used they should be invariably warmed, carefully mixed by shaking, and a cream added. They include calomel in an average dose of 1 grain (.066) suspended in vaselin-oil, salt and water, or mucilage and water; metallic mercury, from 6 to 30 grains (0.40–2); oleum cinereum; mercury with liquid vaselin or lanolin, 20 to 50 per cent. 0.05 to 0.1 at each injection; and the yellow and black oxides of mercury, and combinations of

¹ Traitement de la Syph. par les Inject. hypoderm. de Sublimé. Thèse de Paris, 1872.

² Rev. Scientif. Paris, 1907, No. 24, 5 Ser., vii., p. 745.

³ Wien. klin. Wochenschrift., 1907, xx., No. 39.

⁴ J. A. M. A., 1907, xlix., p. 1041.

these with potassium iodide and other salts. Calomel, in combination with guaiacol, camphor, and oil, has been injected with a minimum of pain.

The so-called antiseptic group includes salicylate of mercury. A Pravaz syringeful is injected every third day in the gluteal region beneath the muscular fasciæ, of the following:

R	Hydrarg. salicylat.,	gr. xv-xxiv;	1 50
	Mucil. acac.,	gr. viij;	533
	Aq. dest.,	f3vss;	165 M.

In this group are also included carbolate of mercury; the thymolate (10 per cent. suspensions in fluid paraffin); and the benzoate associated with sodium chloride, 2 parts, and cocaine hydrochlorate, 1 part, in 500 of water.

The amide group includes mercuric formamidate, 1 per cent. solution; glycocoll of mercury, alaninate of mercury, and succinamide of mercury, the last two in 1 per cent. solutions.

Beside these mercurial preparations, potassium iodide and iodoform have been injected subcutaneously in a few instances, it is claimed with advantage.

Intravenous injections of mercury in syphilis were introduced by Baccelli in 1893, but, according to Marshall, have not been shown to possess any advantages over other methods employed. Chopping, however, had satisfactory results in twenty-three days after introduction into artificially distended veins, of 20 minims of a 1 per cent. solution of mercurous cyanide; Pernet¹ states that the method is especially effective in syphilitic diseases of the eye. Lydston² believes that in 48 hours a patient may be brought completely under the influence of mercury by intravenous injections (15 to 25 minims of a 2 per cent. solution of the bichloride of mercury). Ten cases are reported improved. The median basilic or median cephalic vein in the forearm was selected, care being taken to place the dosage fully within the lumen of the vein and to remove the tourniquet before the discharge of the mercurial solution from the syringe.

Ptyalism, stomatitis, fetor of the breath, or a fungous condition of the gums with inappetence and other characteristic symptoms of the ill effects of mercury, including all grades of gastro-intestinal disturbance, are seen rarely in modern practice, and they should never occur in a properly regulated mercurial course. When they are produced, the tongue projected from the mouth is usually tumid, and exhibits at its lateral borders the imprints of the inner faces of the molar teeth. Its surface is also covered in various degrees with a thin, dirty-grayish coat; and the odor of the breath is peculiarly offensive, being often noticeable at a distance of several feet from the patient. In such cases the food should be liquid and nutritious, both hot and cold drinks should scrupulously be avoided, and

¹ Brit. Med. Jour., Nov. 30, 1897.

² J. A. M. A., 1907, xlix., p. 1662.

the mouth frequently be cleansed with washes containing dilute liquor sodæ chlorinatæ, potassium chlorate, or a weak solution of carbolic acid. In particularly severe cases, potassium chlorate may be employed to the extent of 1 drachm (4.) daily. The compressed tablets of this salt, each containing 5 grains (0.33), may be slowly dissolved in the mouth. The mercurial is to be suspended in all cases, and iced water is to be interdicted, gangrene having followed its use in a few cases. In milder forms tincture of myrrh and of cinchona, diluted with sweetened water, or honey and water, will be sufficient for local medication of the mouth.

Iodine.—Iodine in pill form in doses of $\frac{1}{24}$ of a grain (.002) is of great value as a remedy in syphilis. The drug is, however, employed chiefly in the salts of potassium and sodium. The iodides of ammonium, rubidium, and strontium are less effective. Iodipin (Merck) and lipiodol (Lafay) are iodinated oils, and are employed both by the mouth and by injection.

Iodine possesses some value, without question, in every stage of syphilis, and is, therefore, indiscriminately used by many practitioners. Its value, however, in so-called "late secondary" and "tertiary stages" is incontestably greater than in the earlier lesions of the disease, and its use should largely be restricted to the particular periods in which these manifestations appear. Every prudent physician will hesitate before ordering for a disease exhibiting cutaneous lesions a remedy which will positively produce such lesions in the majority of all patients ingesting it. In this connection the reader will do well to consult the chapter on *Dermatitis Medicamentosa*, in which the various eruptions produced by this drug are recorded. Thoughtful men are beginning to inquire, in the light of the present knowledge upon this subject, to what extent the syphilodermata have in the past been aggravated or obscured by this remedy. He would indeed be bold who should attempt to prove that the medicamentous eruptions thus excited have not, in the past, figured largely in the catalogue of the syphilodermata.

The value of the iodine compounds, nevertheless, properly adjusted to the age and other conditions of the disease, is incontestable. Whether given alone or by the so-called "mixed" treatment in combination with mercury, or administered internally while a mercurial is introduced by the skin, or exhibited by alternation with the metal, in each these compounds find a special value, and may simply be indispensable. Potassium iodide may be given in doses of from 5 grains (0.33) to 1–2 drachms (4.–8.), well diluted with water (a gobletful preferably), three or four times daily one hour after eating. The larger doses should invariably be reached gradually; they should never be employed except by special order of the physician, and when the patient is within easy reach of the latter; and they should always be ordered with the understanding that the patient shall diminish or suspend treatment in case of unpleasant results. When the remedy produces gastric distress, it is administered often

in connection with pepsine, pancreatine, or taka-diastrase. Often the dose is tolerated well when given in a glassful of milk.

Symptoms of iodism other than the production of cutaneous lesions, such as coryza, œdema of the eyelids, abdominal tension and tenderness, and faucial irritation, are often the result of the first few doses of iodine ingested, and these symptoms may bear no relation to the size of the dose. In certain cases, 1 or 2 grains (0.066–0.133) will be sufficient to produce the most disagreeable effects, which, if they occur before the remedy be suspended, may not return with even the largest doses. In a few cases potassium iodide produces violent toxic effects in any dose, owing to exceptional idiosyncrasy. Both ammonium chloride and ammonium carbonate are recommended for use in combination with potassium iodide, as increasing its efficiency. Sodium, ammonium, and lithium iodides possess also, without question, some influence over the disease, but they are for most cases less efficacious than the potassium salt. Of the three iodides named, lithium iodide is apparently most prompt in its effects.

Potassium iodide is employed frequently in the well-known “sirop de Gibert,” which though first popularized in the Saint-Louis Hospital, in Paris, has since been employed extensively in the United States. It has slightly been modified to suit the varying tastes of many surgeons. It is ordered in the following formula:

R	Hydrargyri biniodid.,	gr. ss-ij;	.033-0.133
	Potass. iodid.,	ʒij-viiij;	8-30
	Gentian. syrup. (vel		
	syrup. glycyrrhiz.), }	āā fʒij;	āā 60
	Aq. dest.,		M.
Dose. A tablespoonful in water, after eating.			

The syrup of licorice disguises the taste of the drug better than most of the other syrups used. With the dosage carefully regulated, a few drops (1 to 15) may be administered with advantage to children.

The following are indications for the use of potassium iodide either alone or by the so-called “mixed” method in the treatment of syphilodermata: the occurrence (1) of tubercular, gummatous, or ulcerative lesions; (2) of formidable, nervous, visceral, or other non-cutaneous symptoms with early or late, mild or severe syphilodermata, as, for example, grave ulcerations of the velum or the fauces with a symmetrical macular eruption, or coincidence of a generalized pustular or a papular syphiloderm with hemiplegic, aphasic, ocular, or renal complications; (3) of manifestations which either assume the so-called “galloping” type, being succeeded rapidly by more and more formidable symptoms, or which exhibit the capriciousness of the disease in a reversal of the usual sequence of evolution, as, for example, when symptoms commonly described as “late” phenomena occur within a few weeks after infection and are followed by the early symmetrical rashes; (4) of early or late symptoms occurring in cachectic, strumous, or otherwise debilitated patients. Mercury is assuredly *not* a tonic in tuberculosis commingled with syphilis.

Prophylactic treatment of the initial lesion of syphilis, with a view to the exclusion of systemic infection, has been made the subject of experimentation by Metchnikoff and Roux, who practiced a more or less prolonged inunction at the site of the inoculation with an ointment composed of one part of calomel and two of lanoline. The reports of successes thus obtained in animals, and in one instance in the human subject, are offset by a record of some failures, but a sufficient probability has been established to justify the employment of this measure in available cases.

Local Treatment.—The local treatment of the initial sclerosis of syphilis by complete excision, lauded by Auspitz, has been practised (since the date of his paper in 1879) by Kölliker, Zeissl, Leloir, Chadzynski, Mauriac, and others.¹ The result has proved conclusively that such operative interference furnishes no bar to constitutional infection. Simultaneous extirpation of all lymphatic glands in the vicinity of an initial sclerosis, with ablation of the latter and a mass of tissue about it, have repeatedly proved unavailing to prevent the occurrence of systemic infection. Chancres should not be destroyed by caustic agents of any character, as the caustics are liable to induce either irritative or inflammatory effects which may be followed by denser induration. Ointments, as a rule, are also objectionable, exception being made in the case of hemorrhagic lesions when the removal of an adherent dressing is followed by unpleasant consequences. Cleanliness with soap and water is of chief importance. There are few better local applications at this period of the disease than painting with a saturated aqueous solution of pyoktanin-blue. The parts may then be dusted with a dry powder, such as euophen, iodol, zinc stearate, calomel, hydro-naphthol, or boric acid; or be dressed with a piece of soft lint, saturated in pure or dilute lotio nigra, or, even better, a spirit-lotion containing tannin and carbolic or boric acid. Opiated washes or iodoform (which is an anæsthetic for many ulcerative surfaces) may be requisite in painful and ulcerative lesions.

When a primary venereal sore of any character (the initial sclerosis of syphilis or the chancre) becomes phagedenic or gangrenous, or, even in the absence of both these calamities, extends rapidly in depth or superficial area, cauterization should not be practised. The most effectual treatment of these complications in the genital region is by the employment of the continuous hot water-bath, aided by asepsis. The patient remains seated in the bath (the water being of the temperature most grateful to the affected surface and with great care maintained at that degree of heat) throughout the day, or, in formidable emergencies, if carefully watched, by day and night. The bath is left by the patient only for the purpose of evacuating the bladder or the rectum. Granulation and repair gradually ensue. Whenever the patient leaves the water the parts are dusted with iodoform or with iodol. By this invaluable means, in both hospital

¹ See Keyes' later communication on this subject, *loc. cit.*

and private practice, cicatrization of extensive ulcers which extend from the genital to the pubic region may be secured.

Local treatment of the syphilodermata may be demanded either by reason of their appearance on exposed surfaces, as on the face and the hands, or by reason of their obstinacy or threatening character, as when they are rapidly ulcerating. Macular and papular lesions of the face may be treated by local applications of mercury: 5 per cent. oleate; mercurial ointment, 1 to 2 drachms (4.-8.) to the ounce (30.) of cold-cream salve or of vaselin; red oxide, from 2 to 4 grains (0.133-0.266) to the ounce (30.); or ammonium chloride, $\frac{1}{2}$ to 1 scruple (0.66-1.33) to the ounce (30.) of ointment. Lotions of bichloride, 1 to 2 grains (0.06-0.133 to the ounce (30.)) of cologne, are also efficient. These preparations are more effective if applied at night, and left upon the lesions during the hours of sleep, and each is preceded best by hot bathing of the surface for several minutes, as in the preparatory treatment of acne papulosa. The sulphur preparations employed for the relief of that disease will at times be found useful also in the local treatment of the syphilodermata.

Hot ablution is particularly useful in the treatment of the scaling and frequently fissured lesions of the palms and soles, the pain of the local symptoms in severe cases being greatly alleviated by this treatment. After the epidermis in these parts has been well macerated, the hands or the feet should thoroughly be dried, and the mercurial, tarry, or other salve be well rubbed in. The medicated mulls and plasters are here of value. A glove or a stocking should then be drawn over the part.

Secreting condylomata, flat papules, vegetations, etc., also require bathing with soap and water, especially when situated at the mucous outlets of the body or on the scalp. When the secretion is offensive in odor, formalin, boric or carbolic acid, thymol, or chlorinated soda should be added to the lotion. Cleanliness, indeed, is more essential to the syphilitic patient, man or woman, than to the healthy. After the cleansing or disinfecting ablution the parts may require pencilling with the crayon or with solutions of silver nitrate, 10 to 20 grains to the ounce (0.50-1.5), and may be dressed with a powder, such as dry calomel, euophen, iodoform, iodol, hydro-naphtol, bismuth subnitrate, zinc oxide, sodium salicylate, or starch. Vegetating lesions of these regions may require also pencilling with a crayon of silver nitrate. Ointments, as containing grease, are decidedly objectionable local applications.

Crusted and ulcerative lesions, large or small, are to be treated in accordance with general principles. Crusts should always be removed either by the oil and soap-and-water treatment, or with a dermal curette, after which removal the underlying ulcers should be cleansed thoroughly, pencilled with silver nitrate, filled with powdered boric acid, iodoform, iodol, or calomel, or touched with a 5 to 20 per cent. solution of carbolic acid, and then be dressed with a dilute ointment of mercuric nitrate, 1 to 2 drachms (4.-8.) to the

ounce (30.). Large syphilitic ulcers are often encountered on the surface of the lower extremities, and in this situation elastic compression by a rubber bandage will greatly accelerate their cicatrization.

Ointments of ammoniated mercury, blue ointment, compound iodine ointment, and those containing the yellow oxide are useful in many cases. The mercurial, salicylated, zinc-oxide, and other plasters often are required for infiltrations.

The syphilodermata are in general amenable to the action of the mercurial vapor-bath, which exerts upon them both a local and a constitutional influence. Those affecting the face are benefited thus by exposure to the metallic vapor in the "head-piece" arrangement already described. The patient also may avail himself less comfortably of the same local treatment by holding the breath and exposing the head and face for a few minutes at a time to the fumes of the mercury beneath the blanket, in the plan described as practicable at the bedside.

The syphilodermata, if treated locally by the measures described as useful in non-syphilitic cutaneous affections of similar type, will commonly proceed to a satisfactory involution if the general treatment be skillfully ordered.

The local treatment of syphilitic lesions of the mucous surfaces is both hygienic and medicinal. Catarrhal conditions of adjacent mucous surfaces (vagina, nasal cavity) require attention. The parts should be kept free from all irritation (tobacco in all forms, iced and hot articles of food and drink, condiments, acetous and alcoholic fluids in the mouth; coitus and irritating injections of vulva; napkins that have been soiled over the ano-genital regions of infants). Locally, the silver-nitrate crayon, used as a pencil, is effective in the management of moist patches, applied once daily or every second or third day. Occasionally stronger caustics are required, such as mercuric nitrate or nitric acid. Mouth-washes containing potassium chlorate, myrrh, and honey; 15 to 20 drops in water of Bellamy's iodized phenol; milk of magnesia; very dilute lotions of tincture of ferric chloride; or dilute muriatic acid, a teaspoonful to a pint of sweetened water; and carbolated washes, are required in different cases. In very great soreness and tenderness of the mouth only the blandest applications are tolerated, such as thin flaxseed-tea, oatmeal-gruel as a wash, and gum-acacia water. A few formulæ are appended:

℞	Potass. chlorat.,	3j;	4
	Mel. depurat., }	āā 3ss;	15
	Myrrh. tinct., }		
	Aq. dest.,	ad 3vj;	ad 180 M.

Sig. A teaspoonful in water as a wash for the mouth and throat.

℞	Acid carbolic.,	3j;	4
	Glycerin., }	āā 3ss;	āā 2
	Iodin. tinct., }		
	Spts. vin. rectific.,	3ij;	8
	Aq. dest.,	ad f3j;	ad 30 M.

Sig. Fifteen to twenty drops as a lotion in water, for the mouth.

R Potass. chlorat., 3j; 4|
 Aq. menth. piperit., āā 3vj; āā 180| M.
 Sig. Gargle and wash for the mouth; to be used slightly diluted.

The internal management of these cases is that demanded by the general condition of the system and the stage of the disease, as explained in the concluding pages of this section.

The treatment of inherited is mainly that of acquired syphilis with such modifications as are required by the tender age of the subject of the disease and by the special characters of the eruptive and other symptoms in the infant and child. The mother who is demonstrably the subject of the disease requires antisypilitic treatment during any pregnancy where there is possibility of taint of the product of conception, irrespective of the presence or absence of maternal symptoms; this is especially important in pregnancies succeeding those terminating either in abortion or the birth of a syphilitic child. The infant born of a syphilitic mother or luetic parents should be spared specific medication until evidences of infection are presented, seeing that in some cases the fœtus and newborn infant escape even when lues is made probable by the antecedents of the progenitors. The syphilitic child when the disease is inherited should be kept at the breast of the mother and not be suckled by any other woman. All syphilitic infants require special provision for their nutrition; cod-liver oil generally is indicated. Inunction is to be practised by anointing the swathing-band with a strong or modified mercurial salve, the motions of the child being in general sufficient to insure a proper medication by introduction of the medicament. As the skin of the abdominal surface in these young patients is generally sensitive, care should be taken to suspend the application of the unguent and to apply a dusting-powder until any resulting dermatitis is relieved.

Internally, calomel or the gray powder, $\frac{1}{16}$ of a grain to 1 grain (0.006 to 0.06), may be applied to the tongue after trituration with the sugar of milk. The stronger homœopathic triturations are useful for this purpose. We rarely employ the bichloride of mercury for infants, as the other preparations of the metal are commonly efficient and better tolerated. The salts of iodine are less valuable in inherited than in acquired syphilis, but when indicated the potassium salt may be given in doses of from $\frac{1}{16}$ to 2 or 4 grains (0.006 to 0.133 or 0.266), administered in solution three times daily or oftener when required. Iron is indicated generally, and in particular the iodide of iron, which may be given in the form of syrup 2 to 5 drops in solution. The dosage is to be varied with the age and vigor of the child. Lesions of the mucous surfaces (mouth, anus, nares) require special hygienic care, and the use of lotions of boric acid, formalin, chlorinated soda, and, in especial, soap and water is desirable. These should be followed often, particularly about the ano-genital region, with the application of dusting powders. The eruptive symptoms in inherited syphilis are to be treated like those in the acquired disease, due care being taken to protect the tender skin from irritation. The

tars and stronger mercurial salves should not be employed over the skins of very young infants.

Prognosis.—The prognosis of syphilis is in general favorable, popular opinion on the subject being at variance with fact. Benignant syphilis may disappear without treatment.

Malignant forms of the disease may, but rarely do, destroy life. The element of treatment, both as to its character and the period of its continuance, enters more largely into the estimate upon which a prognosis rests than it does in most other disorders exhibiting cutaneous symptoms. The syphilis untreated, whether because of failure to recognize its character, or of ignorance, poverty, neglect, or dissipation, is usually grave. The same may be said of syphilis occurring in strumous, tuberculous, and cachectic subjects, and in those enfeebled by age, by other diseases, by chronic alcoholism, or by sexual excesses. Hereditary syphilis is by far the gravest form, not merely because of the tender age of its victims, but also because at the earliest period of existence they are burdened with a disease which may first attack organs essential to life.

The majority of adult white patients, with hygienic environment, sooner or later recover from the acquired disease, marry, and beget in the end sound children.

CHANCROID.

This term has been adopted generally in America and England for the purpose of designating the virulent, local, contagious ulcer of the genitals, designated also as the “simple,” the “soft,” or the “non-infecting” chancre, the *chancrelle* of French authors. Chancroid has no relation to syphilis, nor to the neoplasms with which syphilis is commonly classified, though, it is important to note, it may precede, accompany, or follow the initial lesion of that disease. As it is, however, an affection with which the initial sclerosis of syphilis may be confounded, and is also not merely a venereal lesion, but one which may be encountered upon the skin as well as upon mucous surfaces, it is briefly described in this connection.

Chancroids present as distinct a uniformity of feature as the lesions of vaccinia or of herpes zoster. They are thus stamped with special and readily recognized characteristics, differing in this respect from the various modes in which the first lesion of syphilis may declare its nature. The virus, for such it must be termed, of the disease is one *sui generis*, and derived exclusively from lesions of like character. This virus, which is contained in a purulent secretion, is capable of transmission by inoculation and auto-inoculation. After such successful inoculation there is no period of incubation. The results of experimental generation of the virus in human subjects indicate that the pathological process which it awakens can be determined within twenty-four hours after its introduction within the skin. At times, after accidental infection, eight or ten days elapse before the lesion of the disease is manifested, cases presumably in

which the virulent secretion has remained pocketed in the orifice of a follicle or in a fold of mucous membrane, where its irritant effects have finally opened an avenue for its deeper ingress. When typically developed the chancroid is seen to be a pustular lesion, frequently multiple, of roundish outline, beginning as a pinhead-sized, turbid vesico-pustule, rapidly enlarging to a pea- or bean-sized, well-developed, projecting, yellowish, globoid elevation of the epidermis, filled with greenish-yellow pus. When located in furrows or depressions of the surface it may have a linear, oval, or even a dumb-bell shape, the latter in consequence of extension from a sulcus to overlying folds. Clinically the roof-wall of this pustule is not frequently encountered, the objective symptoms being the ulcers which represent the floors of separate lesions. These ulcers vary with the shape of the superimposed pustules, being round, ovoid, or linear, occasionally irregular in outline, with sharply defined or cut edges; they have an uneven, pus-bathed floor; a faint pinkish areola; a supple, non-indurated base; an abundant puriform secretion; and are accompanied or unaccompanied by pain, according to the degree of inflammation present. In consequence of the auto-inoculability of the discharge these ulcers frequently give rise to others in the vicinity, as when the prepuce lies in contact with chancroids of the glans.

The ulcers thus presented usually attain an average size of that of a pea or of a bean in the course of from ten to fourteen days; they then remain in an indolent and suppurative condition, showing no tendency to heal for a fortnight or three weeks; and finally they granulate, exhibiting the ordinary phases of repair. The resulting cicatrix is either transitory or, more often, indelible. In exceptional cases the ulcer spreads widely. In the groin it may attain a diameter of several inches; its floor secreting scantily; its edges lurid, undermined, purplish, or ragged; its color reddish, bluish, purplish, or leaden. Fistulous tracts and sinuses, filled with an ichorous sero-pus radiate in dependent situations; the base of the sore is densely indurated; its career may be prolonged for years, and induce finally a systemic cachexia not different from that seen in all chronic ulcerations of severe grade. In other cases the occurrence of gangrene, or phagedæna, changes the features of the lesion to those of other ulcers undergoing similar metamorphosis.

Chancroids may occur upon any exposed mucous surface of the genitalia of both sexes, upon the integument of the penis, scrotum, labia, thighs, fingers, perineum, peri-anal region, and, very rarely indeed, upon the face. In consequence of their tendency to relapse, their abundant contagious secretion, and their auto-inoculability, chancroids are more frequently encountered than is the primary syphilitic lesion among the filthy, the poor, and the classes that frequent hospitals and dispensaries. Among the wealthy, the well-to-do, and the cleanly this order of frequency is reversed.

The chancroid ulcer is also much more frequently complicated by surgical accidents than is the infecting lesion of syphilis. This

result is partly due to the prevalence of an ulcerative type in all its manifestations, and in part to its situation. Thus, the ulcer is often accompanied by severe inflammatory symptoms, which may be aggravated both by phimosis and paraphimosis, occurring with stenosis of the preputial aperture, or with a long, lax, and redundant foreskin. Phagedæna is also a formidable complication, whether of sloughing or of serpiginous tendency, the lesion in each case losing its chancrous characteristics. It is evident also that the disease may coexist with others of a different character. Thus, a single point may simultaneously be inoculated with chancroidal and syphilitic virus; the former, without an incubative period, followed rapidly by a pustular or an ulcerative lesion; the latter, after its incubation is complete, producing the characteristic symptoms of an initial sclerosis. Chancroids may also be found coexisting with various early and late syphilitic lesions of the genitals, with vegetations, with blennorrhagic discharges and balanitis, with pediculi of the pubes, and with herpes progenitalis. Patients of the class exhibiting these lesions not infrequently present themselves at public dispensaries with three or more of these concurrent disorders.

One of the most serious complications of the chancroid is its association with a specific lymphangitis, periadenitis, or adenopathy. In this case the lymphatic trunks connected with the lesion become inflamed, indurated, and irregularly corded, with the overlying integument often œdematous, reddened, and painful. The infective process in these vessels rarely terminates by suppuration. The bubo of chancroid is more common, and this adenopathy may be either sympathetic, resulting from the severity of the process at the site of the lesion, or be virulent, due to the transmission of an inoculable toxine to one or more of the glands in near connection with the source of the trouble. These different gland-complications may coexist in one person, in men more often than in women, and in about one of each four or five cases presented to observation. When inoculable pus has been formed in a neighboring gland the latter is at once converted into the seat of an abscess, the pus of which, whether evacuated spontaneously or by the knife of the surgeon, speedily inoculates the lips of the wound through which exit has occurred. The wound and contiguous abscess-cavity then form a large chancroidal ulcer, usually inguinal in situation, as the glands in this locality are nearest the most frequent seat of the lesion. Such an inguinal ulcer discharges a greenish-yellow pus often commingled with blood; its borders are undermined, thin, livid or purplish, and ragged; its floor is irregular, sloughy, and often covered with nodules representing the débris of glandular structure; from it depart sinuses traversing the tissues in the vicinity, often downward to the thigh, occasionally upward over the belly. When occurring in strumous and cachectic subjects, or when long neglected or mismanaged, the resulting disorder is of serious character, and it may surpass in duration and severity certain of the varieties of lupus and epithelioma.

These facts have an important bearing. It is true that syphilis is a constitutional disease, and that it usually occurs but once in a lifetime. It is equally true that the chancreoid is evidence of a local and non-systemic disorder, producing only such constitutional effects as may all other local affections of chronic course and severe grade; but it is an error to suppose for these reasons that the chancreoid is the milder of the two maladies. Many of its consequences are much more severe, and some of them even more malignant, than the average of syphilitic sequels, and even, as indicated above, are worse than some forms of other diseases usually classed as malignant. Greater attention should be generally directed to the truth respecting the comparative gravity of the two diseases, as there is widespread ignorance of the facts.

Pathology.—The pathology of the chancreoid, has been illustrated by the researches of Biesiadecki, Auspitz, and Unna. The micro-organisms discovered in all coccogenous lesions are usually abundant and readily demonstrable. Those first described by Ducrey, of Naples,¹ recognized now as the effective agents in the production of the disease² are short, thick strepto-bacilli measuring 1.46 by 0.50 μ . These observations were confirmed by Krefling, of Christiania;³ while the bacilli discovered and claimed as pathogenic by Unna (his observations being later confirmed by Quinquaud and Nicolle) occur in the form of twisted coils and chains, measuring 1.25 by 0.33 μ .

Anatomically, there is disclosed by the microscope a uniform, dense infiltration of the corium with elements which undoubtedly represent inflammatory metamorphosis of the connective tissue of the derma; degenerative changes where the ulceration has proceeded superficially; enlargement of vessels from thickening of their walls, often with diminished lumen; and relatively intact rete and corium at the lateral borders of the ulcer. This fully confirms the inferences suggested by a clinical study of the disease. Many roundish circumscribed, clean-cut ulcers with purulent floors occur upon the skin that bear no relation to the chancreoid disease. It is the history and career of the disease that stamp it with an individuality of its own. It is not the form and appearance of its pus-elements, but their power and potency, which make them singular.

Diagnosis.—Chancreoid is to be distinguished from syphilitic chancre, but no skill, however great, and no experience, however wide, will enable the diagnostician, even when typical chancreoid is present, to assert that syphilis will not follow, until the longest incubative period of the initial sclerosis of the last-named disease has elapsed

¹ Congrès internat. de Derm. et de Syph., Paris, 1889, p. 229.

² Culture and inoculation experiments conclusive as to the agency of the Ducrey bacillus have been made by Istamavaff and Askpeonz, Jahresbericht d. Path.-Microög., 1898, xiv.; Davis, Jour. of Med. Research, 1904, ix.; p. 401; Lancet, Bull. Med., 1898, xii., p. 1051, and Temosezewski, Zeit. f. Hyg. u. Infect., 1903, xiii., p. 327. (Keyes.)

³ Archiv, 1892, xxiv., p. 41.

without production of suspicious symptoms. The rule which necessarily follows is imperative, and, being too frequently ignored, bitter disappointment on the part of the infected individual, and mortification on the part of the physician, have naturally resulted. *No patient suffering from a chancroid can be promised immunity against syphilis until two and a half months have elapsed after the date of last exposure.* Subject to this essential reserve, the diagnosis rests upon the pustular, ulcerative, and discharging features of the chancroid, its failure to indurate at the base, its auto-inoculability, its appearance without previous incubation, its more formidable localized expression of disease, and the characteristics of the accompanying adenopathy. The short-lived, superficial vesicles of herpes progeneritalis, often accompanied by tingling and painful sensations, with sequels in the form of equally superficial, epidermal excoriations, are not to be confounded with chancroids; yet it must be remembered that these lesions may also precede or may accompany any form of venereal disorder. Chancroids are to be distinguished also from early and late symptoms of syphilis developed in the genital region and from non-syphilitic vegetations and molluscum epitheliale having the same localization.

Treatment.—The most effective and ultimately the most satisfactory treatment of chancroids is by asepsis patiently carried out. Less satisfactory is the routine treatment by destructive cauterization with either nitric or sulphuric acid now practically abandoned by the ablest practitioners. Keyes recommends a previous application of pure carbolic acid, in order to benumb the part and thus render the subsequent application less painful. If employed at all, the carbolic acid should carefully be wiped from the sore before the subsequent cauterization, as the two acids will explode if suddenly brought in contact. As the slough separates the ulcer may be dressed in accordance with the general principles governing the treatment of simple granulating wounds. Special care should be taken by all practicable measures to avoid the possibilities of auto-infection. Vinous, carbolated, and opiated lotions, painting with a saturated aqueous solution of pyoktanin-blue, powders of boric acid, iodoform, iodol, calomel, bismuth subnitrate, and starch, simple unguents, and the interposition of a pledget of borated cotton between all affected and sound tissues—these measures in most cases suffice to insure relief. Pencillings with silver nitrate, though ineffective for the purposes of cauterization, often answer a good purpose in hastening repair. The prepuce may require division or circumcision.

For grave and extensive ulcerations, accompanied or unaccompanied by phagedæna or by gangrene, there is no treatment comparable in value with the hot water-bath of an average temperature of 98° F. For the details of this method the reader is referred to the paragraph devoted to the treatment of syphilitic chancre.

Phimosis and paraphimosis, when complicating chancroids, require the surgical treatment appropriate for the relief of those con-

ditions. For the accompanying adenopathy in chancroid disease, before suppuration has occurred, rest is essential, with laxatives and gentle local compression. When there are great heat and tenderness a few leeches may be applied. After pus has formed it may be evacuated with an aspirator-needle, or by a free incision in the long axis of the swelling, followed by curetting the abscess-cavity and by the usual antiseptic dressings. Constitutional treatment by iron, quinine, cod-liver oil, and the employment of a generous diet with milk, malt liquors, or wines are often required in broken-down and debilitated persons.

Prognosis.—The prognosis, in uncomplicated cases, is generally favorable. The scar left by a suppurating gland in the groin is indelible, but it becomes less conspicuous with years. Sloughing and gangrenous sores leave deforming cicatrices, especially when occurring at the apex of the glans, to which they usually give a peculiarly truncated shape. A just reserve should be made in all cases, complicated with syphilis or extensive fistulous sinuses, the latter, as mentioned above, often persisting for years.

MYCOSIS FUNGOIDES.

(Gr., *μύκης*, a mushroom.)

(GRANULOMA FUNGOIDES, GRANULOMA SARCOMATODES, INFLAMMATORY FUNGOID NEOPLASM, ULCERATIVE SCROFULODERM, ECZEMA TUBERCULATUM, FIBROMA FUNGOIDES, LYMPHODERMIA PERNICIOSA, SARCOMATOSIS GENERALIS. Fr., LYMPHADÉNIE CUTANÉE.)

This disease was described first in 1814 by Alibert, as “*Pian fungoïde*.” Its symptoms resemble those of that affection, though not in any way related to it.

The disease is uncommon; about three hundred cases have been recorded in literature:¹ but so many of these have been observed carefully and fully reported that all the symptoms of the disorder are established. An attempt has been made to distinguish between two forms. There is, however, but one.

Symptoms.—For convenience in description the symptoms may be grouped roughly in three stages, which, however, do not always occur in regular succession, and of which the first and second may never be manifested.

“**Premycotic Stage**” (*Erythematous Period* [Bazin], *Stadium Eczematosum* [Kaposi], *Erythrodermie Pityriasique en Plaques Disseminées*).—This first stage is characterized by the occurrence of a

¹ For further discussion of the subject, see monograph by Wolters, *Bibliotheca Medica*, Abt. D. ii., H. 8, Stuttgart, 1899 (with sixteen illustrations and complete bibliography); Hyde and Montgomery, *J. C. D.*, 1899, xvii., p. 253 (bibliography); Galloway and MacLeod, *B. J. D.*, 1900, xii., pp. 153 and 187 (with full histological report on lesions of various types taken from three cases); Leredde, *La Pratique Dermatologique*, t. iii., p. 527 (bibliography); Breakey, *J. C. D.*, 1902, xx., p. 316 (autopsy and histological report); and Stowers, *B. J. D.*, 1903, xv., p. 47 (with recent bibliography).

PLATE XL



Prefungoid Stage of Mycosis Fungoides.

(From a painting.)



series of cutaneous phenomena of different types, which have been described as resembling, if not identical with, eczema, lichen, erythema, pityriasis rubra, psoriasis, urticaria, furunculosis, and other congestive and inflammatory cutaneous affections. In a contribution¹ based on a personal experience in thirteen cases and a review of the literature of forty-eight cases in which these early phenomena were described, we concluded, in common with a few other investigators, that these early dermatoses, though differing considerably in clinical type, have many characteristics in common and are the varied expressions of a definite morbid process. The term *Prefungoid*, employed by Morrow, would designate better this stage than the generally accepted term *premycotic*. The mischief undoubtedly is declared with the earliest pruritic symptoms, and the skin-eruptions in the early periods of mycosis should be considered as significant expressions of a general disease as the tumors themselves.

The earliest phenomena vary greatly, and may imitate any of the above-named dermatoses. The most frequent lesions, however, are in the form of round or circinate, sharply defined, erythematous patches, psoriasiform plaques, or infiltrated discs, usually characterized by scaling and by itching. These areas are commonly from one to six centimeters in diameter, but may be of any size, and in rare instances (as in one of our cases) the redness and scaling may be universal. Generalized vesiculation has also been noted. The lesions usually are dry; but at times may be moist, crusted, or even the seat of small papules and vesicles. The color varies through the different shades of red, orange-red, or scarlet, often combined with tints of brown or purple. As the lesions persist thickening and infiltration of the skin are noted, and the patches become more sharply outlined, more distinctly circinate in contour, and, by extending peripherally while clearing in the centre, may either coalesce or begin to assume the gyrate and fantastic figures so characteristic of the disease. Itching is usually a pronounced feature, but may be absent. The course of the lesions is capricious, even more so than in eczema. One or all of the patches may disappear suddenly and spontaneously, only to return without apparent cause in old or new sites, and after intervals of days or months. Treatment, save by radiotherapy as noted below, either constitutional or local, seems to have almost no influence upon the course of the lesions. This stage, during which the patches come and go, may last a few months or several years (thirty, Dubrenilh) before the appearance of the more characteristic areas of infiltration.

Period of Infiltration (*Lichenoid Period* [Bazin, Vidal, Brocq, Fabre]).—In what may be called conveniently the second stage, circinate, sharply defined, elevated plaques and nodules appear, either in the site of previous lesions or independently of them or concurrently with them. The nodules are pea-sized or larger; the infiltrated

¹ J. C. D., 1899, xvii., p. 253.

plaques are button-sized to palm-sized, or larger, sometimes extending over the greater portion of the chest, back, or abdomen. The color varies from a bright pink through varying shades of red and occasionally of brown or violet. The surface may be smooth or verrucous, or fissured and excoriated as the result of scratching. The pruritus is usually severe, but may be absent. The shape and career of these plaques are almost, if not quite, diagnostic. They are circular or circinate, as a rule, and as a result of an extending periphery and clearing centre they are constantly changing in both site and contour, often moving over the surface in gyrate bands or lines, or assuming half-moon, crescent, horseshoe, kidney, or other, often fantastic and grotesque, shapes. Again, they disappear and reappear without apparent cause, as do the lesions of the first stage. While in many cases these variations in site and form require several months for completion, cases not infrequently occur in which the whole aspect of the disease changes in a few days. In one of our patients the lesions assumed the form of a curious network of connecting, broad, flat-topped ridges, between which were corresponding valleys of normally colored and apparently normal integument. As a rule, the lesions on disappearing leave no trace of their previous existence, but they may be followed by areas of more or less permanent pigmentation or of vitiligo. More rarely, circumscribed areas destitute of pigment and resembling leucodermatous patches, may occur in the skin where no preceding lesion has been observed. The symptoms of this period often occur with, or may be replaced by, those of the preceding stage. The two periods together may last many years (fourteen in one case) before the appearance of tumors, though in exceptional instances they may be preceded by tumor-formation.

Fungoid Stage (*Mycofungoid, Neoplastic Period*).—In the so-called third stage, which in some instances is the first and only stage, the characteristic *Tumors* of the disease appear upon the face, scalp, chest, and other portions of the body. They are bean- to cocoanut-sized, or larger; whitish, pinkish, pale, or dull reddish in hue, sessile or pedunculated, well rounded or lobulated, and distinctly circumscribed. They are covered usually, before ulcerating, with a dry scaling or crusted epidermis. When developing from the plaques above described they may be quite flat. They may spring from any of the previously described lesions or from the sound skin. They occur upon all parts of the body, upon the palmar and plantar surfaces, the arms, the forearms, the thighs, the legs, the face, and the back. Often they are in various degrees pigmented, showing purplish, brownish, or even black colors. They are usually painful, and may or may not be tender. The pruritic sensations of the premycotic stage may now be absent. When the tumors have attained maturity, and before involution has begun, their appearance, especially upon the face, is characteristic. Here they are smooth, moderately firm, globular, often lobulated, or sausage-shaped, of a peculiar reddish hue, and when numerous produce a lepra-like deformity, closing the eyes

in consequence of their size or weight, producing the leonine brow and the elephantiasic ear.

Like the other lesions of this disorder, the tumors may disappear spontaneously, while others appear; or they may all disappear to return after uncertain intervals without known cause. As a rule, they leave no trace of their previous existence, though they may be followed by pigmentation or slight atrophy of the skin. Sooner or later some of the tumors degenerate, and lead to superficial ulceration,

FIG. 129.



Mycosis fungoides.

accompanied by adenopathy, usually followed by papillary excrescences and mushroom-like growths of varying sizes from which the disease obtains its name. At the summit of these the hairs usually fall. At times they may be the seat of much more destructive ulceration, though with but few exceptions this destruction is limited to the new-growth, and even large fungoid and apparently deeply ulcerated tumors may disappear completely and leave no trace further than pigmentation and possibly a small atrophic scar.

The general condition of the patient at first seems unaltered; later when the tumors ulcerate, exhaustion occurs and the victim usually dies as a result of febrile processes, of intercurrent disorders, pneu-

monia, tuberculosis, nephritis, leukemia, cachexia, or pyæmia. When the tumors are many and ulceration extensive the appearance of the patient is repulsive in the extreme; the exhalations from the body are in the highest degree fetid, and the difficulty of procuring asepsis, hygienic care, and comfort for the wretched sufferer is well-nigh insurmountable. Extirpation of the tumors usually is followed by recurrence, frequently with added malignancy.

The superficial and deep lymphatic glands may enlarge, and this adenopathy, as in the case of the tumors, may subside to be replaced

FIG. 130.



Mycosis fungoides.

later by similar involvement of the same or other glands. Other complications of the disease are: pleuropneumonia, pulmonary tuberculosis, hemiplegia, and crysipelas.

The duration of the tumor-stage is brief compared with the others, frequently death occurs within a few months, though it may be postponed two or three years.

Etiology.—The disease is more frequent in men than in women, often in those of unusual weight and size, and usually occurs between the thirtieth and fiftieth year of life, most often after the fortieth year, though in a few instances it began earlier, even in childhood. The disease bears no relation to tuberculosis, lepra, or syphilis. Though the cause of the disease is not definitely known, there can be little question as to its infectious character. It is produced probably by specific micro-organisms, but direct evidence of contagion and successful inoculation-experiments are wanting.

Pathology.—The disease has been studied by many observers, including ourselves. While the reports of different investigators at first reading apparently vary widely, closer study of the recorded observations indicates that on the main point they agree. The early lesions show on histological examination œdema and dilatation of the vessels, especially the lymph-capillaries, with often some endothelial proliferation, and a more or less dense cell-infiltration that is limited usually to the upper part of the corium, except where it surrounds some of the deeper vessels in the forms of sheaths or "cuffs." Galloway and McLeod¹ described in the early stages a connective-tissue cell-infiltration not only about the vessels, but also about the hair-follicles, the sebaceous glands, the muscles of the hair-pouch, the ducts of the coil-glands, and occasionally along the lymphatic spaces between the connective-tissue fibres. They conclude that the infiltration may originate in the cells of any of these structures. The infiltration in some instances is diffuse, but sharply separated from the deeper parts of the corium by a horizontal line, and from the rete above by a narrow layer of connective tissue. In other instances the infiltration occurs in round or irregular areas, separated by bundles of normal connective tissue. Where the cells are most compact they are supported by a very delicate fibrous structure made up in part of elastic fibres. Degeneration of collagenous and elastic fibres occurs in the late, but not in the early, stages of the disease. The cells forming the infiltration are in the main of the connective-tissue type, but in many cases they and their nuclei show the greatest diversity in size, shape, and staining qualities. Round, cuboidal, or irregularly shaped cells with little protoplasm and a deeply staining nucleus are numerous. Many of the irregular bodies are apparently fragments of cells. In many places the cells are packed so closely as to modify their shape and size. This multiformity of the cells is apparently characteristic of the disease, and Unna believes that it is due to the result of two antagonistic processes constantly going on, that is, cell-multiplication and cell-destruction, and that many of these odd forms are nothing more or less than cell-fragments. Mast-cells, multinuclear cells, and giant-cells are seen in some lesions, but are

¹ B. J. D., 1900, xii., pp. 153, 187.

absent in others. Mitotic figures are frequent. The papillæ are enlarged, in places packed with cells, in others more or less œdematous, as also are portions of the subpapillary layer. The rete is everywhere hypertrophied, the interpapillary processes being elongated, broadened, and frequently branched. In places the cells are swollen and œdematous, with spaces between them. Mitotic figures here also are numerous, especially in the basal layers. Wolters, in summing up the results of all investigations, justly states that no distinctly specific changes peculiar to the disease, have been recognized.

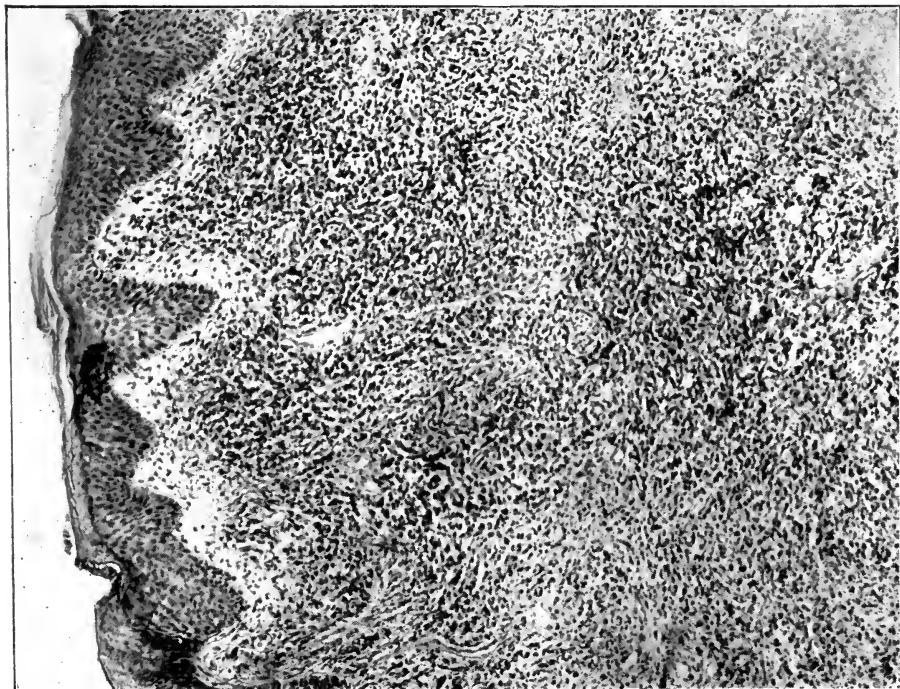
As the lesions progress toward the tumor-stage the cells in the corium become more regular in form and size, and the rete becomes much thinner. In the fully developed tumors the rete usually is reduced to a few layers of cells (sometimes but one), but in some instances it dips down deeply into the growth in a way to suggest epithelioma were it not that these epithelial processes are very slender. Many of the tumors correspond closely in structure to sarcoma, others show the histological formation of granulomata.

Numerous micro-organisms have been seen in the blood and tissues, and some have been cultivated, but none has been demonstrated to have any pathogenic relation to the disease. Among them may be named streptococci in the capillaries of granulation-nodules, and staphylococci in cultures from blood. Other examinations of blood, of infected tissue, and of tumors were wholly negative as to the discovery of cocci. Wolters agrees with other observers that the organisms recognized and cultivated are in general the results of secondary infection, and bear no etiological relation to the disease.

It is alleged that mycosis fungoides is a form of sarcoma. The facts, however, that fully developed tumors disappear spontaneously, and that in but few instances has involvement of viscera been reported in mycosis fungoides argue against the claim. In the reported case of Brandweiner¹ in which metastases were found in the brain, the correctness of the diagnosis has been questioned. The autopsy in the severe case pictured in Fig. 130 showed no visceral involvement. Changes in the deeper organs have been found similar to those which occur in leukæmia and pseudoleukæmia, but no definite relations have been recognized between these conditions and the disease under consideration. The various conceptions of the disease held by diverse authorities is summarized by Jarish² in groups as follows: (1) as a granuloma, by Köbner, Geber, Auspitz, Weissner, Doutrelepon, Ledermann, Hochsinger-Schiff. (2) As an adenoid growth, the expression of a diathesis "lymphadénique," by Ranvier-Gillot, Demange, Fabre, Gaillard, Amicis. (3) As sarcoma or lymphosarcoma, by Kaposi, Funk, Siredey. (4) As a disease *sui generis*, midway between adenomatosis and sarcomatosis, by Vidal, Brocq, Leredde, Paultauf. (5) As a disease *sui generis*, midway between granulomatosis and sarcomatosis, by Walther, Ullmann. There is

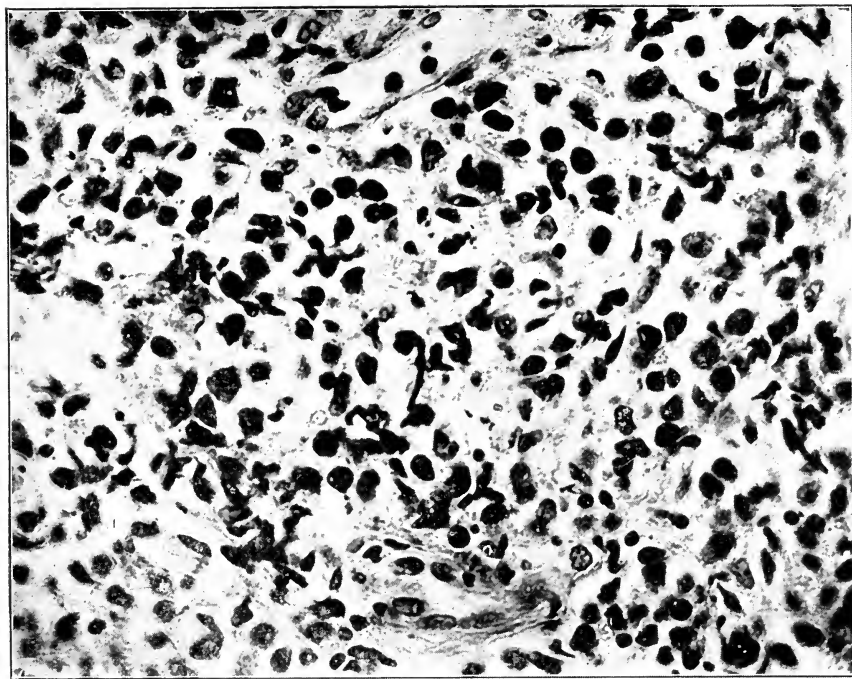
¹ Monatsh., 1905, lxi., p. 417.

² Hautkrankheiten, Wien, 1908.



Mycosis Fungoides. (C. J. White.)

FIG. 1. (Section.) Shows absence of stratum granulosum and parakeratosis of horny layer. Shows depth and character of cellular invasion and absence of all



Mycosis Fungoides. (C. J. White.)

FIG. 2. (Section.) Pubic region. Shows the nature of the cellular growth—*i. e.*, lymphocytes, large and small. Shows the minimum amount of collagen present.



a growing tendency among observers to class mycosis fungoides with the infectious granulomata or in the fifth group mentioned above.

Diagnosis.—The age, weight, and often the protuberant abdomen of the patient are usually to be considered. In the early erythematous stages the disease is to be distinguished especially from eczema, psoriasis, urticaria, erythema multiforme, and dermatitis exfoliativa. While a positive diagnosis cannot always be made at this time, in the majority of cases a careful consideration of the typical features just described will leave little doubt as to the nature of the disease. The circinate contour of the lesions, their spontaneous disappearance and reappearance, and the rebelliousness to treatment of what appears to be a mild and superficial inflammatory process, are features not found to the same extent in any of the other dermatoses named above. Aside from the absence of these three marked characteristics in psoriasis there is much more thickening of the plaques and there are characteristic scales, while the situation, history, and other features of the lesions are usually sufficient for a diagnosis; in moist forms of eczema the discharge and multiformity of lesions are both greater than in mycosis fungoides.

When these early lesions of mycosis fungoides appear in irregular patches the diagnosis from eczema can be made only after they have been under observation for weeks or months. In those exceptional cases which begin as a generalized exfoliative dermatitis an early diagnosis is rarely possible.

After the appearance of infiltrated plaques, or of well-developed tumors in case the other stages are absent, the diagnosis is usually clear. The infiltrated areas, nodules, and smaller tumors may at times closely simulate leprosy; but the history, the absence of areas of anæsthesia and other characteristics of leprosy, and the histological examination should clear up the diagnosis without difficulty. The tumors are distinguished from those of sarcoma by their history and career, and by their final formation of characteristic fungoid, superficially ulcerating masses.

Treatment.—We have employed radiotherapy for one year in an unquestioned case of prefungoid mycosis fungoides with excellent results. The plaques have disappeared and the patient for months at a time has been wholly free from the symptoms of the disease. Each return of those symptoms has been combated successfully by the same measure. Jamieson,¹ Weidenfeld, Lustgarten,² and Elliot³ have each had a similar experience. Observation, however, of these cases for nearly twenty years will be needed before one can predicate the possibility of curing the disease by these measures. At present it can be said merely that the prospects of such a cure are brilliant and the immediate results highly satisfactory. The pruritus and complicating dermatoses which may be present in the early stages may be treated locally with various soothing, protecting, and antipruritic ap-

¹ B. J. D., 1903, xv., p. 1.

² Archiv, 1903, lxvii., p. 123.

³ J. C. D., 1904, xxii., p. 185.

plications (see treatment of Eczema) according to the indications in each case presented.

The comfort of the patient is to be secured by all measures, including anodynes in an advanced stage of the disease, and his strength should be supported by a generous diet and tonic regimen. Arsenic in full doses and by hypodermatic injection has been of apparent service; Koebner reported one patient cured by this treatment. Locally ichthyol, bismuth oleate, and many other preparations have been of service in allaying the symptoms and retarding the progress of the disease. When the affection is generalized, tepid baths are productive of great comfort; the use of boric acid, resorcin, aristol, carbolic acid, or some similar agent is indicated by the fetor arising from the person. The ulcerating masses may be protected by a wet antiseptic dressing, or after cleansing dusted with the zinc stearate compounds, iodoform, aristol, or other powder, and protected by a proper dressing. Extirpation of the tumors is proper when such a course will add to the comfort of the patient.

Prognosis.—The prognosis is unfavorable except as it shall be modified hereafter by radiotherapy. The patient may survive from a few months to a maximum of fifteen years, the average being from two to four years. After the development of tumors the patient may live but a few months or at most two or three years. Three cases of recovery are on record, one of the patients being relieved after an attack of erysipelas.

LEUKEMIA CUTIS.¹

Cutaneous and subcutaneous lesions of various kinds occur occasionally in association with the general disease termed leukemia. They are found both in acute and chronic types of the disorder as well as in the different varieties, lymphatic and myeloid.

Symptoms.—In acute lymphatic leukemia hemorrhages both petechial and diffuse occurring in the skin and mucous membranes are frequently noted as are also ulcerations and necroses: the latter commonly in the mucous membranes of the mouth and nose, less often in the skin. In chronic lymphatic leukemia lymphomatous nodules and tumors are found in the skin and subcutaneous tissues as well as in the mucous membranes. In myeloid leukemia these manifestations may occur but less frequently than in the other variety. The skin in the latter variety is usually dry, lusterless, anæmic; and may be the seat of a symptomatic erythema and urticaria with secondary complications, and occasionally true lymphomatous tumors.

¹ Literature: The following works, with articles referred to in their appended references, were consulted in the preparation of this article, in addition to special papers mentioned below: Nothnagel's *Encyclopedia of Practical Medicine*, American Edition, 1905, volume devoted to diseases of the blood, pp. 539-637 (many references); Unna, *Histopathology*, pp. 618-624, many references; Crocker, 3d ed., pp. 1036-1042; Nicolau, *A Contribution to the Clinical and Histological Study of the Cutaneous Manifestations of Leukemia and Pseudo-Leukemia* (*Annales*, 1904, p. 753), abstr. *B. J. D.*, 1905, xvii., 234-235; Wende, *Leukemic Lesions of the Skin*, *J. C. D.*, 1901, xix., p. 479; Shattuck, *A Case of Lymphatic Leukemia with Purpura*, *J. C. D.*, 1904, xxii., p. 118.

In general the cutaneous manifestations may appear to precede or follow the systemic disease, but at any time they are symptomatic of a grave disease of the blood. While the general symptom complex is often sufficient to correctly place the varieties of this disease from a clinical standpoint, the final diagnosis rests on the microscopic blood findings, the latter method being imperative in clinically mixed types. It is evident from a study of the literature that certain cases show characteristics that appear to be closely allied to mycosis fungoides and sarcoma cutis; and opinions differ concerning their nosological position as to whether they represent a single one or a combination of two of the above disorders.

There are two types of cutaneous lesions: a superficial and a deep variety. Both may occur in the same patient and division is made merely for purposes of description. In the first are hemorrhages, petechial and diffuse, papular, vesicular, urticarial and pigmented lesions, symptomatic erythema, diffuse scaling erythrodermia, and, in rare cases, a moist or scaling dermatitis accompanied by itching. Among the deeper lesions are ulcers and areas of necrosis, especially of the mucous membranes but also of the skin, induced by the breaking-down of hemorrhagic or lymphomatous deposits. Nodules and tumors of various sizes, shapes, and colorations, also occur. All these lesions may develop on different parts of the body but show a predilection for the extremities and face.

The nodules vary in size up to that of a coffee bean and may be few or numerous, and occur especially on the extremities and face. They may be pale and waxy, reddish, brownish red, or yellowish red in color, firm or soft in consistency, movable with the skin, smooth or scale covered, oval, round, or flat, or even have depressed centres, and may be often accompanied by telangiectatic vessels. When abundant on the face, especially in association with larger growths, a leonine expression may be exhibited.

The tumors vary in size up to that of a hen's egg or larger and like the nodules may be few or numerous. They grow slowly but continually as a rule, and only exceptionally break down.

In a small proportion of cases of acute lymphatic leukemia green tumors (chloromata) occur. Children more frequently suffer and the tumors are usually seen on the face, temples, and cranium. The osseous system is especially affected, the bone marrow often being replaced by a peculiar greenish mass. The lymphogenous green tumors are deposited in the facial and cranial bones, in or under the periosteum or dura. In addition, practically every bone of the body has been described as the seat of these peculiar green tumors.

Etiology and Pathology.—The cutaneous manifestations above described are a part of the general leukemic process which involves all portions of the human organism. The essential cause is unknown. The leukemic nodules and tumors are situated anatomically in the corium and upper part of the subcutaneous tissue and are made up of accumulations of lymphocytes. The infiltration of these cells is not

limited to the nodules and tumors but occurs throughout the skin even where no clinical evidence of its presence exists. The process begins as a perivascular lymphocytic infiltration especially about the coil-glands and gradually spreads upward toward the epidermis and downward into the subcutaneous tissue. The morbid growth usually is separated from the epidermis by a thin layer of normal corium. While the infiltration may be dense, it spreads around normal structures without destroying them. The lymph vessels in the region are full of lymphocytes which might mean that these cutaneous lymphomata produce some of the specific cells found in the general circulation. In the cases resembling mycosis fungoides a multicellular infiltration similar to that found in this disease is described.

Treatment.—The treatment is that of the general affection under consideration. Radiotherapy is advised as a temporary alleviative measure.

Lymphodermia Perniciosa (Kaposi) (*Fr., Erythrodermie Mycosique*).—A group of cases is described in which the true leukemic process occurs later, the early manifestations being exhibited as a moist itching dermatitis, with redness and swelling of the skin, and in which finally nodules and tumors form with a tendency to break down. These cases resemble in a high degree mycosis fungoides; and Kaposi's case is classed as such by Vidal, Hallopeau, Paltauf, Crocker, and others.

PSEUDOLEUKEMIA CUTIS.

The cutaneous manifestations occurring in this disorder correspond closely with those described in connection with lymphatic leukemia, though pruriginous papules and urticaria are more frequently found. The lymphatic cutaneous tumors are similar; and a pseudo-leukemia may follow a general erythrodermia as occasionally happens in lymphatic leukemia.

SARCOMA CUTIS.

(Gr., *σάρξ*, flesh.)

Sarcoma of the skin is a rare disorder characterized by the occurrence, either as primary or as secondary developments, of a single or multiple, pea- to egg-sized and larger, pigmented and non-pigmented, cutaneous and subcutaneous, connective tissue neoplasms, having a marked inaptitude for ulceration, malignant in character, recurring after extirpation, and usually terminating fatally with involvement of the viscera.

The term *sarcoma*, meaning a fleshy tumor, was employed originally by Virchow to designate malignant connective tissue tumors: it included actinomycosis and other affections which are now known to belong to the granulomata. Dubreuilh has reported a case of infective granuloma of sarcomatous aspect caused by multiple fragments of oyster shell imbedded in the skin. Carcinoma manifests its malignancy by ulceration and toxemia while sarcoma destroys life by the

continuous development of new cutaneous and visceral metastatic tumors. At present there is no satisfactory classification of the sarcomata as anomalous and transitional cases are constantly observed.

For convenience the group may be divided into: *melanotic sarcoma*, *non-pigmented sarcoma*, *idiopathic multiple pigment-sarcoma* of Kaposi, and *sarcoid* growths.¹

MELANOTIC SARCOMA.

(NEVOMELANOMA, NEVOCARCINOMA.)

This is the most malignant and rapidly fatal of cutaneous neoplasms.

Symptoms.—The chief clinical characteristics of this affection are: its development in a mole, the production of pigment, the rapid involvement of the adjacent lymphatic glands, and metastasis.

As the first evidence of the disorder a mammillated or pigmentary mole increases in size and assumes a darker color without or following irritation by caustics, electrolysis, friction, or traumatism; or a wide area of black pigmentation may develop about a mole; again as especially emphasized by Evé² there may be no appreciable change in the mole but the first evidence of malignancy may be the enlargement of the neighboring lymphatic glands; it was the observation of cases of this category which once suggested that this form of sarcoma sometimes originates in lymphatic glands. The disease may also begin by the sudden appearance of clusters of black macules and nodules pin-head- to small pea-sized, either independently or in close proximity to a mole.

The pigment present varies greatly in amount in different cases and in different tumors of a given case; hence there is a variation in their appearance as they present all shades of color: brown, light-brown, to jet black. In extreme cases the tumors become veritable pigment fabricators, so that a streak composed of tumor cells and black pigmentation may extend from the primary tumor to the nearest lymphatic glands; or extensive areas of pigmentation may appear in the skin at some distant point; pigment may also develop in affected lymphatic glands, and in metastatic tumors; it may be sufficient in amount to cause melanemia and melanuria but may be entirely absent.

The lymphatic glands adjacent to the growth usually enlarge at an early date, and on microscopical examination pigment and tumor cells similar to those of the original tumor are found. Numerous metastatic lesions develop in the skin and in any of the visceral organs.

¹For a full discussion of sarcoma and sarcoid, see Johnston, J. C. D., 1901, xix., p. 305 (a careful histological study with 7 excellent photomicrographs, a review of the subject, a proposed classification based on pathological findings, and bibliography), and *ibid.*, 1903, xxi., p. 23 (a case of fibro-sarcoma); Pini, *Bibliotheca Medica*, Abt. D. ii., Heft 9, Stuttgart, 1901 (bibliography). De Amicis, *Trans. Twelfth Internat. Cong. Med.*, Moscow, 1897 (abstr. in *Brit. Jour. Derm.*, 1897, ix., p. 440); and Fordyce, *Morrow's System*, vol. iii., p. 670. See also special references under Sarcoid Growths.

²Practitioner, 1903, p. 165.

The disease may primarily appear in the eye, pharynx, or vulva, as well as in deeper structures.

The lesions are bean- to egg-sized, usually single or multiple, very firm or doughy, sessile or pedunculated, spheroid or lobulated; and vary in color from grayish brown to inky blackness. The epidermis may be discolored, thinned, and intact, or be ulcerated. The nodules are often surrounded by blackish puncta which eventually develop into tubercles. The lesion or lesions may for a long time remain stationary, or they may rapidly be followed by generalization as a result of local irritation, either by extension from a central point to adjacent tissue, or by transmission through the lymphatics to a distance from the primary nodule.

In a case lately observed by us the left lower extremity of a middle-aged woman was studded with split-pea-sized to marble-sized, ink-black masses from the ankle to the middle of the thigh. The larger were always centres of groups of similar pinhead-sized black nodules. The skin of the region affected was swollen, inextensible, inelastic, and as firm as sole-leather. The disease had extended from the ankle upward in the course of a few months.

Melanotic sarcoma is one of the most malignant and rapidly fatal of all neoplasms. Therapy is usually unavailing; and the prognosis is grave indeed, a fatal result usually occurring with rapidity after the occurrence of generalization, and commonly with visceral complications by reason of secondary deposits.

Unna, Gilchrist,¹ Schalek,² and others³ believe that malignant growths arising from pigmented moles are usually (if not always) carcinomatous, hence the name *nevocarcinoma*, while Johnston and some others still contend that they are connective tissue growths, and should be retained in the sarcoma group.

Melanotic Whitlow (Hutchinson) is described as a chronic onychia, displaying pigmented spots, suggesting silver-nitrate stains at the edge of the nail-fold, where eventually a fungus tumor forms with increase of pigment until the nail is exfoliated, and the process becomes generalized.

PRIMARY NON-PIGMENTED SARCOMA

occurs mostly on the trunk; the tumors may be few or number several hundred. When numerous they are usually bean-sized, but where there are few, they frequently attain the size of a hen's egg or are even larger, and are situated in the subcutaneous tissue. Scarcely two cases are alike. The lymphatic vessels and glands are not affected. The disorder may terminate in general debility and visceral metastases.

¹ J. C. D., 1899, xvii., p. 117 (investigation of two cases and of several pigmented moles; bibliography).

² J. C. D., 1900, xviii., p. 145 (histological study of five cases, with review of literature).

³ Cf. Whitehead, Johns Hopkins Hosp. Bull., 1900, xi., p. 221 (two cases, with review of literature); and Whitfield, B. J. D., 1900, xii., p. 267 (two cases, with references).

Recurrent Fibroid of the Skin (Hutchinson), beginning usually in the lower extremities, and tending to slow extension, to rapid and persistent recurrence, and to ulceration and formation of fungous tumors, with ultimate marasmus, is set down by Crocker as a rare form of spindle-cell sarcoma.

IDIOPATHIC MULTIPLE PIGMENT-SARCOMA¹ (KAPOSI)

owes its coloring to cutaneous hemorrhages and not to pigment-deposit. The points which justify the classification of this as a form of sarcoma are: it is an affection of the extremities, developing symmetrically in both hands or both feet; the tumors frequently disappear; and the lymphatic vessels of the infiltrations and tumors are affected. Pick has reported two cases in which the disease began as *elephantiasis lymphangiectatica*. It is the most common form of sarcoma of the skin.

Symptoms.—The disease occurs chiefly in male subjects (from forty to sixty years of age) who have been laborers whose hands and

FIG. 131.



Multiple hemorrhagic sarcoma. (LIEBERTHAL.)

feet become the seat of an œdema, accompanied by pruritus and other subjective sensations. Later, brownish, bluish-red, or dark-purplish spots appear, out of which develop pinhead- to pea-sized nodules,

¹Recent literature: Sellei, Monatshefte, 1900, xxxi., p. 413 (bibliography) and Archiv, 1903, lxvi., p. 41 (with plate and bibliography); Sequeira-Bulloch, B. J. D., 1901, xiii., p. 201 (bibliography and colored plate); Bernhardt, Archiv, 1902, lxii., p. 237 (bibliography), and *ibid.*, lxiii., p. 239 (2 plates); Koehler and Johnston, J. C. D., 1902, xx., p. 5; Pick, Archiv, 1906, lxxvii., p. 267.

gradually increasing in volume, discrete, tender, and often grouped. They may be the seat of lancinating and radiating pains. As they multiply a lardaceous infiltration progressively involves the depth of the integument, until an elephantiasic condition is produced, a hand, a foot, or an entire limb becoming of cartilaginous hardness, bluish in tint, and covered with a smooth, mammillated, squamous, or rugous envelope, which may be also the site of tumors of considerable size. These tumors are fewer in number and smaller in volume as they spread from the distal to the proximal parts of the limb. They may be sessile, pedunculated, and grouped, but they are always of a deep-bluish or violaceous tint.

These growths may remain for a long time stationary; or they may be entirely resolved, the patient apparently securing complete recovery. Very rarely they ulcerate or exhibit slight erosions. At times they are covered with or surrounded by telangiectases, or by tissue exhibiting infiltration of blood. When the mucous membranes are involved, points, patches, disks, or infiltrations of a dusky-reddish or a bluish shade appear on the inner side of the gums, the lips, the tonsils, or over the palate; and there is visceral involvement with lymphatic and vascular changes. The usual signs of physical exhaustion ensue, with fever, dysenteric symptoms, hæmoptysis, and marasmus. The disease may last only from three to five years, but a duration of fourteen years has been recorded. Post mortem tumors have usually been recognized in the viscera. Only a few infantile cases have been recorded.

Remarkable instances of complete recovery from this affection are multiplying. A patient with the hands completely relieved was shown at the International Dermatological Congress in London, in the year 1896, Kaposi having verified the diagnosis. A patient rapidly recovering from the same disorder is under our observation. It is doubtful if this condition be a true sarcoma—in the sense in which this term is generally accepted.

Etiology.—The etiology of the sarcoma group of disorders is unknown. According to Babes, sarcomata are frequently congenital, and are found not rarely in early youth upon the eyelids, the extremities, and the genitalia. A belief in the parasitic origin of some, if not all, of the sarcoma group is entertained by some observers. Jurgens,¹ L. Loeb,² and others have grafted bits of sarcoma into the tissues of rabbits, rats, and mice, and produced tumors identical pathologically with sarcoma. Loeb transplanted sarcoma in this way through a number of generations.

Pathology.—Sarcoma of the skin may be primary, but is probably more often secondary to the disease in deeper organs of the body. Histologically, it is a connective-tissue growth, made up largely of round- or spindle-cells, and corresponds closely to the structure of

¹ *Centralbl. f. Chirurgie*, 1896.

² *Jour. Med. Resch.*, 1902, viii., p. 44.

PLATE XLII



Multiple Pigmented Idiopathic Sarcoma.

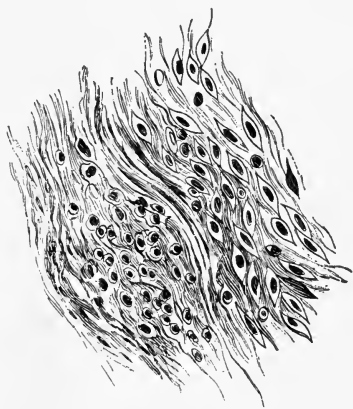


sarcoma in other parts of the body, the spindle-cell being somewhat more frequent than the round-cell type. Other mixed types, as fibro-sarcoma, angio-sarcoma, or lympho-sarcoma, are seen occasionally. Kromayer¹ believes the epithelial cells undergo transformation into connective tissue, and Loeb² has shown that such a change may take place when epithelial cells are transplanted into connective tissue.

In melanotic sarcoma, the pigment present is melanin; it does not react to the ferro-cyanide test. The tumor is made up of small round epithelioid cells which stain poorly; some authors believe that they are of epithelial origin and others that they are connective-tissue or endothelial. They are clustered in alveolar connective-tissue.

In the so-called "idiopathic multiple pigment-sarcoma" of Kaposi the pigmentation is due entirely to hemorrhage and the blood-slowness which follows. The growth is highly vascular, containing many newly formed vessels, the walls of which are very thin and often are made up of the cells of the tumor. The cells are spindle-shaped and the tumors are situated deeply in the cutis or in the subcutaneous tissue. In the older lesions there may be endothelial proliferation. The lymph spaces are dilated. Involution occurs through destruction and resorption of the tumor cells and pigment, and the organization of fibrous tissue. Observers differ as to the propriety of classing the condition as a sarcoma or as a granuloma.

FIG. 132.



Sarcoma: spindle-cells visible in sections of cutaneous nodule removed from a sarcomatous patient. (About $\times 300$.)

Fordyce³ describes several cases of localized angio-sarcoma of the skin in which the single tumor was identical histologically with the generalized sarcoma of Kaposi.

In primary non-melanotic sarcoma the growth, according to Fendt, is composed of large round cells, which in some tumors are encapsulated and in others diffused through the cutis. Where the infiltration is diffuse the collagen disappears, though the elastic fibres are unmodified. At the centre of the nodules the cells undergo degeneration and lose their staining power. Necrosis of the nodule may occur, producing an abscess, which discharges through a small opening in the integument.

Diagnosis.—The diagnosis rests upon the history, symptoms, and microscopical examination of the new-growth. Sarcoma should not be confounded with fibroma, epithelioma, gumma, or lupous nodules.

¹ Zeitschrift, 1896, iii., p. 263.

² An experimental study of the transformation of epithelium to connective tissue, W. W. Warren, 1899.

³ Amer. Jour. Med. Sci., 1900, cxx., p. 159.

Treatment of sarcoma is unsatisfactory. Surgical ablation of these tumors is apt to be followed by their speedy return.

Koebner's injections of arsenic (usually Fowler's solution, 2 to 4 drops in 1 to 2 parts of distilled water, repeated every second day for months, with gradual increase of the dose) seem to have proved successful in two cases. Wende reports a case improving under this treatment. Arsenic, potash, and ergot, internally; and salol, camphorated naphthol, aristol, and bismuth subnitrate, locally, have secured only transitory benefit. Successful results, but also several deaths, are reported from inoculation with cultures of *Streptococcus* of erysipelas. Favorable results have been reported in a few instances by Coley and others from injection of the combined toxins of this streptococcus and of *Bacillus prodigiosus*. In the majority of cases these measures are unsuccessful. Pusey, Coley, and others report favorable results with the *x*-rays. With this agent they have succeeded in relieving pain, and in a few instances in causing a disappearance of the tumors. In a case of glioma in a child which had recurred twice after operation, we succeeded with the *x*-rays in preventing a recurrence of the growth after a third operation.

Prognosis.—The prognosis in sarcoma is unfavorable, a fatal issue occurring in most cases.

SARCOID GROWTHS.

Sarcoid is a term used to designate cases in which there is a generalized eruption of tumors of small size. They are seldom larger than a lima bean. For the present they may be classed conveniently with the Sarcomata.

MULTIPLE BENIGN SARCOID (BOECK).

It is now generally recognized that this affection is a granuloma in no way related to sarcoma. Some clinicians believe that it is an independent affection. Broeck has accepted the opinion of Darier that it is a tuberculide. The basis of this theory is the microscopical findings which are those of a tuberculide and the frequency with which patients suffering from the disease present distant foci of tuberculosis.

Symptoms.—The following summary of Boeck's original article is an excellent description of the disorder.

Clinically we find in a middle-aged, pale, thin man groups of lymph-nodes much swollen, and on examination a slight augmentation of the number of white corpuscles. At the same time there exists a wide-spread, somewhat symmetrical eruption, of firm nodules of varying size on the head and extensor surfaces of the trunk and extremities. They range in size from a hemp-seed to a bean and the larger have irregular contours. They involve the whole skin and are movable with it. Only on the scalp is the infiltration not palpable. Here only yellowish outlines are seen. The color of the early nodules is bright-red, becoming darker, and finally yellowish or





Clinical Varieties of Cutaneous Carcinoma.

brown. Slight scaling occurs on older lesions. They show a tendency to peripheral spreading and central depression. On the face they have a peculiar appearance, with blue centre and yellow border, a feature present in almost all cases. The nodules disappear finally, leaving as a rule a loss of substance in the skin, which may be white on the face, yellow on the back, and darker at the periphery on the legs. Exudation and ulceration never take place. A papular eruption grouped like lichen planus was seen on the inside of the thigh. A tendency to develop at the old injury should be remembered. The symmetry is not such as is found in affections whose localization is evidently determined by central nerve influence. The disease seems to be benign and disappears under arsenic or spontaneously.

Histology.—In benign sarcoma the following histological changes are described by Boeck. The areas of new-growth might be described as peri-vascular sarcomatoid tissue built up by excessively rapid proliferation of epithelioid connective-tissue cells in the peri-vascular lymph-spaces, with little addition of other varieties. The tumor soon begins to degenerate and the tissue is rarefied, showing a net-work of branched connective-tissue cells. It should be remembered that true giant-cells of sarcomatous type are found, though rarely. Compared with other new-growths of the skin this must be said histologically to possess affinity to sarcoma, and also to the very rare cases of so-called pseudoleukæmia cutis described by Arning and Max Joseph. The new-growth here described, nevertheless, seems at present to be *sui generis*. It should be emphasized particularly how different the histology of this process is from that of leukæmia cutis with its lymphoid tissue and small lymphoid cells.

Treatment.—The disease may disappear spontaneously or under prolonged treatment with arsenic but in the majority of cases it progresses slowly through a number of years to a fatal termination.

CARCINOMA OF THE SKIN.

(EPITHELIAL CANCER, CARCINOMA EPITHELIALE, RODENT ULCER.
Ger., EPITHELIALKREBS; *Fr.*, CANCROÏDE.)

Great as has been the divergence of opinion respecting the nomenclature, classification, and pathology of Cutaneous Carcinoma, there has been, none the less, a gratifying advance toward a unification of ideas on a pathological basis.

As evidences of this advance may be cited the almost general adoption, as synonymous, of the terms Carcinoma and Epithelioma; the definite inclusion in the Cancer group of rodent ulcer and of Paget's disease; and the recognition, simply as varieties, of tubercular, lenticular, and melanotic carcinoma, as well as of numerous other forms which differ more in location and course than in any inherent peculiarity.

Definition.—A carcinoma of the skin is a new growth, usually single, of greater or less malignancy, arising from the derma or its appendages, consisting of epithelial cells more or less atypical in structure and evolution, and extending into tissues where they do not normally occur, tending to give rise to metastasis, local or general, rarely spontaneously retrogressing but leading if not completely eradicated, to general cachexia and death.

Classification.—Carcinomas of the skin may be classified: pathologically, as squamous-celled, small- or cuboidal-celled,¹ and as cancer arising from the prickle-cells or from the basal-cells;² clinically, as superficial, deep, and papillary, and as benign and malignant; anatomically, according to their location, as on the lip, tongue, eyelid, etc.

Symptomatology.—**Superficial or discaid epithelioma** usually is displayed first upon the sound skin in the form of one or of several

FIG. 133.



Rodent ulcer. (FORDYCE.)

pinhead-sized papules, flat infiltration disks, or nodosities of a dull-yellowish, reddish, grayish, or dirty wax-like hue. The growth may also have its origin in previously existing skin-lesions which are both numerous and different from one another. Among the latter

¹ Fordyce, *Jour. des malad. cutan. et syphil.*, 1901, s. vi., xiii., p. 106 et seq.

² Krompecher, quoted in *Lexer-Bevan "General Surgery,"* p. 939.

may be named: fissures and excoriations (especially those long teased by caustic applications); warts, nævi, acneiform and molluscoid lesions; and the dry or greasy epidermal scales often seen at the orifices of sebaceous glands in the faces of the aged. The outline of the newly developed growth as a consequence varies, being roundish, linear, or irregular. As a result of accident or traumatism (especially scratching and picking, which the history of a large proportion of all cases includes) there forms a superficial excoriation, which may be covered with a sero-sanguineous crust after the desiccation of its scanty and ichorous secretion. In the progress of its development it is often noticed that new foci of disease appear in the immediate vicinity of the first, represented by subepidermic indurated nodules, or superficial "pearls" resembling milia, whitish and lustrous, with marked tendency to vascularization, exfoliation, and superficial ulceration.

RODENT ULCER¹ (*Jacob's Ulcer*, *Ulcus Exedens*, *Noli-Me-Tangere*, *Cancroid Ulcer*).—The characteristics of this form of superficial epithelioma are a roundish, fissured, or slightly angular contour, and a reddish or reddish-brown, irregular, granulating, and mamillated floor, covered with a thin translucent, viscid serum, which, in drying, suggests the effects of a varnish over the part. The edges of the ulcer are clean-cut, indurated, everted, usually well attached, and seen in horizontal profile, irregularly indented. The symptoms are slight at first; the lymphatic ganglia and general health being unimpaired. Its site of election is the face, particularly the eyelids, nose, temples, and lips, though the genitalia, the hands, and the feet may be affected, Of two hundred and fifty cases collated by Heurtaux, in one hundred and ninety the face was attacked.

Some English writers still describe the rodent ulcer as distinct from epithelioma, chiefly by reason of its individual peculiarities. Pathologically no distinction can be established between the two.

The clinical features upon which this distinction is based are: the slow or intermittent development of rodent ulcer; its tendency to destroy, as it extends, all the tissues within reach; its failure to implicate the system by secondary deposits or metastases; its rounded and often widely everted edges, or better, lip, often distinctly vascularized; its gouged floor exhibiting unequal levels; its slight tendency to granulation; its feeble or negative attempts at repair; and, above all, its pearly gray, somewhat fluted border. The importance of the last mentioned finding cannot be over-estimated in the differentiation from lupus, syphilis, and other forms of skin cancer. Pathologically, this firm pearly border represents the strong connective tissue barrier upon the resistance of which depends the relatively mild course of rodent ulcer. All these symptoms are those of epithelioma, if one chooses to employ that term in its large and proper sense. The rounded or oval excavation, often exceedingly clean cut, at times with a corded and

¹ For full discussion of this type of epithelioma, see Dubreuilh et Anche, *Annales*, 1901, s. iv., ii., pp. 705-780 (seventeen figures; bibliography).

whitish rim, producing little if any pain, is characteristic of the rodent ulcer, yet in its extension it may exhibit all the symptoms of a deep epithelioma.

"CRATERIFORM ULCER."—Under this title Hutchinson describes a form of epithelioma distinguished chiefly by rapidity of invasion. Its onset is by the formation of a roundish or conical mass which rapidly exhibits ulceration, a central crater forming with exceedingly dense walls.

The subsequent course of the lesion varies, its evolution being generally slow and accomplished in years. Sometimes having attained a maximum of size, the ulcer, if unmolested, long persists without appreciable change. In other cases the base cicatrizes and the epithelioma completely exfoliates, leaving an outlying linear ulceration which may persist or spread. In yet other cases, after a persistence of from ten to twenty years, the ulcer may spontaneously close and the disease be at an end. Sometimes the ulceration is very superficial and slowly spreads in circles, segments of circles, or in irregular gyrate outlines, the older portions healing and cicatrizing while the border advances. Such lesions may cover considerable areas of the body and closely resemble the serpiginous lesions of syphilis and lupus. In many cases the papillomatous element is marked. To this form of superficial discoid epithelioma the name Paget's Disease is sometimes applied, as the process is practically the same as that which attacks the nipple and breast. Finally, any one of the destructive and malignant cancerous processes may be awakened, and the epithelioma be thus transformed from the type of the superficial to that of the deep variety of the disease.

PAGET'S DISEASE¹ (*Eczematous Epitheliomatosis of the nipple, Malignant Papillary Dermatitis, Cutaneous Psorospermiosis*).—This disorder was first described in 1874 by Paget,² and has since attracted the special attention of a number of English, French, and American observers, including Thin, Duhring, Malassez, Darier, Wickham, and others.

At the onset the condition suggests an eczematous involvement of the areola of the nipple, usually of one breast only, in women between forty and sixty years of age. According to Besnier and Doyon, the earliest change is without question a choking of the lacunæ of the nipple with corneous cells, and this either without the operation of any known cause or as a consequence of a localized eczema, a galactorrhoea, or other irritant. When early recognized the surface is intensely red and granulating, exuding copiously a clear viscid secretion, and producing subjective sensations of heat and burning, with intense or with moderate itching. The definition is distinct, the tissue is indurated, and the tenderness and pain are usually well marked and distressing. A conspicuous feature of the disease is the circumscribed infiltration of the skin and subcutaneous tissue, which

¹ For bibliography, see Matzenauer, Monatshefte, 1902, xxxv., p. 205.

² St. Bartholomew's Hospital Reports, 1874, p. 87. See also the paragraphs in this treatise devoted to this subject under the title of Eczema.

on palpation suggests a large-sized coin or button let into the substance of the areola and surrounding parts.

When the disease has progressed to this point a cancerous infiltration of the breast is usually recognized, at least after its removal, though even with great care it may not always be possible to dis-

FIG. 134.



Paget's disease of the breast.

tinguish it before ablation of the gland. Crocker, however, holds to the belief that the disease of the nipple may endure for years without resulting retraction and development of scirrhus of the breast. The French recognize three stages: that in which the disease is limited, respectively, to the nipple, to the areola, and to the breast, the latter, of course, succeeding but not replacing the earlier. In all cases there is no attempt at repair; and when abandoned to its course the ultimate result, after five to eight or more years, is a profound ulceration with destructive effects most noticeable in the region of primary invasion, the entire breast having become cancerous. Cases of Paget's disease affecting other parts of the body have been reported. In such instances, the process is identical with that of superficial discoid epithelioma described above.

Deep, or Tubercular, Epithelioma.—This variety may originate in the manner already described, or may be from the first characterized by its specific features. It commonly begins by the formation of roundish, very firm, pea-sized nodosities, closely set in the skin and subcutaneous connective tissue, or be thus situated and well projected from the sur-

face. In the course of months and years these nodules develop to form a nut- or even a small egg-sized tumor, roundish, dark reddish in color, and delicately vascular on its surface. This tumor may be a deep, flattish, or globoid development within the skin; or be a well-defined nodule attached to it; or (and this is a common form) be a dense thick, flattened plaque, a centimetre or more in diameter, its walls

FIG. 135.



Epithelioma of the forehead. (DOUGLAS W. MONTGOMERY.)

steeply descending to the sound skin on either hand or moderately everted; its center depressed by atrophic changes; its surface shining, waxy, pinkish, or red, with ramifying capillaries. "Satellites" may form in its vicinity.

Degeneration of these forms produces in the course of time an ulcer either like that described above, or one which deeply and destructively encroaches upon the tissues beneath. In advanced cases the ulcer is irregular in contour, with a clean-cut, everted, indurated lip; eroded and "gouged," hemorrhagic and granulating floor; thin, viscid secretion which is foul and purulent at times when the resulting destruction is rapidly accomplished; and a deeply attached base which may be perforated by a crateriform exulceration, extending down to or through muscles, fasciæ, cartilage, and bone. The lymphatic ganglia become simultaneously involved, and a general cachectic condition is established. Death may ensue from marasmus, exhaustion, or hemorrhage in the course of several months or from one to three years.

Papillary Epithelioma.—The cancer in this variety assumes the form of a malignant papilloma. In these cases a pedunculated or sessile, narrow or broad-based, smooth-capped or spongy and verrucous vegetation is attached to the skin upon which it forms. It may originally be as small as a pea, but usually it increases considerably in vol-

PLATE XLIV

FIG. 1



Multiple Carcinomata, with Diffuse Precancerous Hyperkeratosis.

FIG. 2



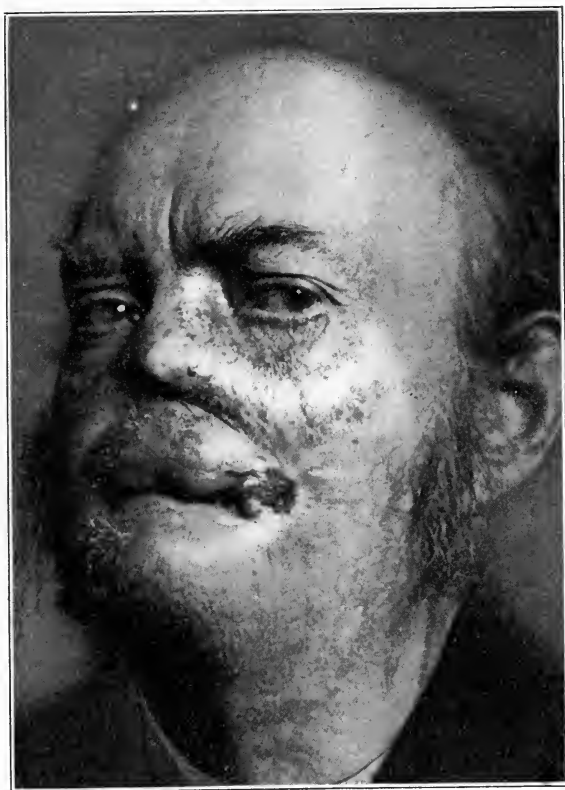
Section from a Small Tumor from the same patient.



ume, being not rarely pigeon's-egg- and turkey's-egg sized. The surface is either dry, reddish yellow, smooth, and lustrous; exfoliating and secreting an offensively smelling sanguineous or translucent fluid; or is moist, granulating, filamentous, and intermingled with hairs, as when it occurs upon the bearded cheek. Degeneration occurs later, fissures forming first; subsequently there appear superficial, and finally deep ulcers which ultimately assume all the features of the epithelioma described above.

In some cases the epithelioma forms a soft, hemispherical, small nut- to egg-sized tumor, which upon pressure discharges numerous convoluted plugs, composed of epithelium, fatty masses, and a puru-

FIG. 136.



Carcinoma developing upon lupus vulgaris.

lent secretion. The bases of these soft masses are remarkable for the ease with which they can be curetted and thus radically removed.

A careful study of well-marked cases of papillary epithelioma indicates clearly that while ulceration often results, the center of the mass breaking down and furnishing a typical cancerous excavation, with hard and rounded or oval border, uneven base, irregular granu-

lating floor, and offensive discharge, the picture may be wholly different. Occasionally the superficial process extends widely over the brows, cheeks, and chin, interspersed with raised cicatriform areas, suggesting that ineffectual attempts had been made to check the disease by surgical measures. These apparently atrophic disks, mingled with vascular, florid, fungiform, pyriform, and oddly shaped outgrowths, are really cancerous infiltrations of the type of discoid epithelioma. They may be seen gluing the lobe of the ear to the cheek, or everting the lower lid, even when superficial papillary vegetations are predominant features of the disease.

The Rarer Clinical Types.—**CANCER OF THE CONNECTIVE TISSUE.**—This is rare as a primary cutaneous manifestation, but appears generally secondary to a cancerous involvement of other organs, as of

FIG. 137.



Cancer en cuirasse, chiefly involving the right side of the chest.

the female breast. It is termed also *Scirrhus*, *Hard*, *Fibrous*, or *Lenticular Cancer*. It occurs either upon the skin covering a breast which has previously been transformed into a cancerous mass or as a cutaneous relapsing lesion after extirpation of the latter. Its symptoms are pea- to bean-sized, densely firm, shining nodules, varying in color; or a more or less diffuse infiltration of the skin, of similar characteristic hardness, associated often with hyperæmia of a purplish-red shade.

When the cancerous infiltration is widely diffused and densely indurated, involving a large portion of the integument of the thorax, the condition is termed by the French *cancer en cuirasse* (Fig. 148), a title first given by Velpeau. The malady is striking in its peculiar-

ities, and in the highest degree serious. The integument of a large portion of the chest, usually more in front, but also behind, and even a part of the anterior abdominal wall, is converted into a dense, leathery envelope, often so compressing the chest-wall as seriously to impede respiration. The edges of the infiltration are poorly defined save at the lines where tongue-like prolongations (*languettes*) of dull-reddish hue indicate the advance of the scirrhus process over the skin. The lymphatic circulation is obstructed, the glands enlarge, and, what is almost pathognomonic of the disorder, the upper extremity, especially the forearm, usually of the side chiefly involved, becomes enormously swollen and œdematous. The nipple may or may not be retracted; the breasts, one or both, are firmly bound down

FIG. 138.

*Cancer en cuirasse.*

to the chest-wall by the cuirass of dense skin, hard, smooth or rough, shining, and either reddened in dull hues or of normal tint, here and there traversed by vessels, and breaking down into ulcerations, usually first about the nipple, but also elsewhere. The process is one of

the more rapid of the scirrhus metamorphoses of the body, as a fatal result is usually reached in a few months, though years have in some cases elapsed before death resulted. One of our patients, an unmarried woman with breasts in the virgin state, perished in the course of a few months, the cancer having originated in the skin. Miliun-like masses, as large as grains of wheat, undergoing fatty degeneration in the centre and readily expressed like comedones, are occasionally present.

We have had several cases of this disorder under observation, two being made the subject of a paper,¹ with illustrations of the clinical appearances, and morbid condition of the tissue. Two of the patients were men. An instance of widely disseminated lenticular cancer of the skin (illustrated by portrait), described by Morrow,² occurred in a healthy-looking woman as a secondary phenomenon after removal of primary cancer of the breast. Whether the nodules be, as to cutaneous manifestations, primary or secondary, the symptoms are generally the same. The lesions are closely set, shining, firm, reddish papules, infiltrations of a dull-reddish hue, miliary and pigmented deposits, tubercles varying in size, subcutaneous nodules, and secondary results in the way of formidable ulcers, crusts, and fungous growths.

TUBEROSE CARCINOMA is a rare manifestation of the disease, occurring in the form of multiple, firm, peanut- or egg-sized, roundish nodules, which break down by ulcerative processes into deep losses of tissue. It is frequently accompanied or followed by cancerous involvement of other organs. It occurs chiefly upon the face, hands, arms, and chest, though also upon other portions of the skin of persons of advanced years, either as a primary or a secondary cancerous manifestation. Guinard³ reports a cancer of this variety, remarkable for the smallness of the existing nodules, which varied in size from that of a hempseed to that of a pea. They covered the entire thorax, the back, and the right arm; and had here and there broken down into ulcers. One of the latter was as large as the hand.

MELANOTIC OR PIGMENTED CARCINOMA is that form in which both the epithelium and connective-tissue framework of the cancer are richly supplied with blood-vessels, and, probably, as a consequence of transudation from the latter, with an abundance of pigment-granules in groups and clusters. These growths usually begin as hempseed- to pea-sized, single or numerous, soft or dense nodules, which may develop in time into tumors of considerable size, and which are stained in various shades from a grayish-brown or a slate color to a dead black, the pigment being occasionally displayed irregularly in streaks or bands over the surface of the growth. They occur over any portion of the surface, often upon the extremities and the genitals, starting frequently from benign pigmentary lesions, such as nævi

¹ Amer. Jour. Med. Sci., 1892, ciii., p. 235.

² J. C. D., 1884, ii., p. 1.

³ Union Méd., 1881, xxxi., p. 205.

and moles. Anatomically, the pigment is found to be deposited both between the cells and in the protoplasm of the cells themselves.

In a few instances the disease is limited to single melanotic growths of this character. The cancer is apt to develop into the papillary form, furnishing thus fungoid vegetations which have a noteworthy tendency to degenerate into ulcers. Often such verrucous masses are seen surrounded by grayish or blackish papules, or by a diffuse cancerous infiltration of the integument; they also exhibit irregular pigmentation of the surface. The disease often appears in the viscera, in the form of disseminated cancerous nodules, each highly vascular, and exhibiting in varying quantity granules of pigment. The growth has usually a relatively rapid course and malignant career. Relapses are frequent, the amount of pigment usually increasing with each relapse.

Recent investigations (Cf. Melanotic Sarcoma) indicate that the majority if not all of the malignant pigmented growths which spring from moles and *nævi*, and which in the past have been considered to be sarcomatous, are in fact instances of pigmented carcinoma.

ENDOTHELIOMA of the skin has been reported in a few instances¹. In the three cases reported by Spiegler,² and in three others collected by him from literature, numerous tumors, varying in size from a pin to an orange, were located on the scalp. In some of the cases pea-sized tumors were seen also upon the face, neck, back, and chest. The course of the growths was comparatively benign. In Fordyce's case³ a pea-sized tumor formed at the border of a lupous scar on the forearm. The histological structure of these growths is that of a small-cell epithelioma, except that the cells are grouped about dilated blood-spaces, and their origin from the endothelium of the blood-vessels can be demonstrated.

Features of the Clinical Forms.—Epithelioma of the skin occurs also with multiform features, almost as numerous as the several different lesions from which a cutaneous cancer may take its origin.⁴ Thus, a wart, a "button," a vegetation, a crack, an erosion may result in a fissure that bleeds easily and refuses to heal. After months or years there forms an epithelioma, assignable to one of the clinical varieties described above. In other cases there may be a number of greasy scales upon the skin-surface resembling those seen in well-marked *seborrhœa sicca*; and in one or two spots the removal of these scales offers to the eye a superficial erosion implicating the derma, bleeding freely, and, when undisturbed, crusting and slowly spreading under the crust rather than healing. In yet other cases a thin pellicle of apparently loosened epithelium, looking like a papery crust, is found, when removed, to cover three or more shallow ulcers, unexpected and hidden from view by the tenacious pellicle which had

¹ For bibliography, see Waldheim, *Archiv*, 1902, lx., p. 225.

² *Archiv*, 1899, l., p. 163.

³ *Amer. Jour. Med. Sci.*, 1900, exx., p. 159.

⁴ Cf. Fordyce: "Clinical and Pathological Observations on some Eearly Forms of Epithelioma of the Skin," *N. Y. Med. Jour.*, June 9 and 23, 1900.

protected them and beneath which they had indolently and painlessly developed.

These varieties or types of epithelioma may coexist in different portions of the same integument, or the one may develop from the other, a malignant papillary growth springing from a superficial or a deep cancerous infiltration. Familiar examples of the disease are seen upon the eyelids and contiguous portions of the nose; the cheek and the lower eyelid, the latter being often drawn into ectropion by a cicatriform bridle or band; the nose or lip and adjacent mucous or osseous tissue; and the glans and prepuce where the vegetating forms are of more frequent occurrence. The vast destruction wrought by the widest development and consequent degeneration of epithelioma is sufficiently recorded in the annals of both medicine and surgery. A woman sixty-four years of age was exhibited at the clinic, in the centre of whose face an ulcerating epithelioma had left a wide chasm, after destroying three-fourths of the nose and upper lip, and the hard palate with all the upper teeth and the antrum. The bones at the base of the skull were exposed. This case illustrated well the occasional remarkable tolerance by the system of the profoundest encroachments of epithelioma. She was then digesting and assimilating food with fair profit, and suffered chiefly from pain. She did not die until several months had elapsed, and then only as the result of hemorrhage from an ulcerative opening into one of the large arteries.

Regional Epitheliomata.—CANCER OF THE HEAD is recognized as constituting nearly three-fourths of all cancers of the skin. Upon the brow, the alæ of the nose, the temples, cheeks, chin, scalp, or other part, the disease may begin either upon or beneath entirely normal skin, or in that which has pathologically been changed. The origin of the disease is usually ascribed to the picking, scratching, or shaving over a sebaceous wart in an old man; or in similar traumatisms of acneiform, seborrhoic, or furuncular lesions in either sex. In other cases the dermatologist, consulted with reference to some other ailment of the skin, can recognize, in persons of the age most liable to such accidents, one or several pin-head-sized or larger milium-like nodules, clustered about the temples or the nose, that indicate the site of the awakened epitheliomatous change. The disease progresses slowly, spreading superficially along the alæ of the nose in irregular lines, in more complete centrifugal outline over the temple and brow; almost symmetrically over the tip of the nose, and with odd indentations of contour in the dense integument immediately in front of the tragus of the ear. The vegetating forms are more common on the brow, scalp, and chin; the "rodent-ulcer" type, over the temples and cheeks. The more superficial varieties in any part of the face may slowly be converted into the deeper. The flattened, egg-sized disks of infiltration are more common on the cheeks and chin.

The devastation produced by malignant cancer is nowhere more conspicuous than in the face. Cartilage, bone, muscle, and entire organs melt before its ravages with astounding readiness. Within

a period of two years a circumscribed flat epitheliomatous infiltration, limited for many months to one cheek, may spread to the point of destroying the ear, eye, and inferior maxilla of one side of the face, opening into the larynx and œsophagus, and not producing a fatal result until the jugular vein of the same side is opened by ulceration.

CANCER OF THE LOWER LIP, far more common in men than in women on account of the tobacco-habits of the former, may arise either as a minute lobule or as a circumscribed thickening on or near the vermillion border, usually of one side, or as a linear, narrow, and shallow excoriation, often protected by a thin crust, extending well along the mucous edge of the lower lip that is in contact with the upper when the two are lightly approximated. Later, the lip may be the seat of a defined tumor, small nut- to egg-sized, that may deeply involve the entire thickness of the lip, encroach upon the chin, loosen the teeth, destroy the gums, larynx, pharynx, tongue, and maxilla, and eventually produce one of the formidable and remediless chasms of the lower part of the face already described.

CANCER OF THE GENITAL ORGANS is submitted to the surgeon more frequently than to the dermatologist. The glans penis, the

FIG. 139.



Carcinoma and pre-cancerous keratoses.

clitoris, and the prepuce are occasionally the seat of a warty variety; but the scrotum, labia, thighs, mons veneris, and abdominal walls, as well as the parts first named, may be involved in the superficial or the

deep form of cancer. In persons of cleanly habits the superficial variety of epithelioma may persist in the genital region as indolent and innocuous as upon the face; but where filth is permitted to accumulate about the part (lochial, menstrual, catarrhal secretions; pus, urine, feces, etc.) the spread may relatively be rapid. The ulcer is then deep, seated upon an indurated and very tender base, and has the steep, punched edge and hemorrhagic floor of the rodent ulcer. Ulceration may, later, open the rectum, vagina, corpora cavernosa, perineum, and deep perineal fascia, resulting in vast destruction that proves fatal by exhaustion of the forces of the patient.

CANCER OF THE EXTREMITIES, particularly of the back of the hand, is at first usually papillomatous, or of the flat, superficial form. It may appear upon the left hand of right-handed patients. A form of peculiar interest to the dermatologist is that which is prone to develop upon the hand of the *x-ray* operator. A number of cases due to the persistent action of the Röntgen ray upon the unprotected hand have been reported in recent years. Its progress is indolent, and when properly treated is much less liable to grave ulceration than epitheliomata in other situations. In special regions, especially on the lower extremity, where the force of gravity generally aggravates any ulcerative process, there may result caries, necrosis, fistules, loss of phalanges, etc.

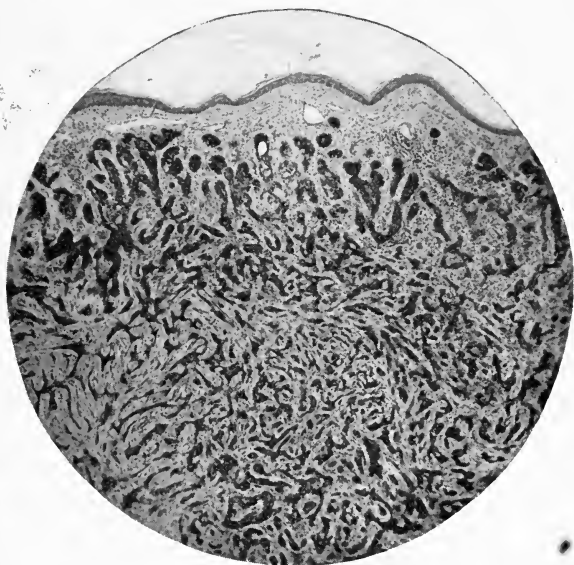
CANCER OF THE MUCOUS SURFACES may be primary or secondary in origin. The mucous lining of the oral and nasal cavities, of the vagina, the rectum, and the balano-preputial sac may thus be involved, either by extension of the disease from the neighboring cutaneous surface or by primary involvement of the mucous tissue. The most important, by reason of statistical frequency, is cancer of the tongue and buccal membrane, often having its origin in the leucoplastic striations, plaques, or thickenings, known as "smokers' patches," *ichthyosis linguæ*, *psoriasis linguæ*, etc., an etiological factor strongly emphasized by von Bergmann. A pinhead- to pea- or bean-sized superficial excoriation is usually the first lesion to which attention is attracted, reddish in color, granulating, tender, and not often very painful; or the beginning is a shallow fissure at the edge or on the tip of the tongue or on the mucous face of the lower lip, its long axis commonly at right angles to that of the organ upon which it forms. Beneath, with more or less rapidity (as a rule slowly) dense induration occurs, lancinating pains dart from the affected region toward the ear or along the jaw, the submaxillary and other glands become tumid and tender, deglutition is painful, and in severe cases well-nigh impossible; or from the nasal membrane the disease extends toward the palate, pharynx, or larynx, ulceration, when it occurs, opening up a vast chasm which represents all these cavities. In the vagina and the rectum a cancerous change may begin with merely a thickening of the surface of the mucous membrane leading in the course of time to a superficial and later to a deep ulcerative process; or, as in cutaneous epithelioma, the papillary form may be represented in vege-

tations, cauliflower-shaped, filiform, or simply warty and mammillated, that eventually degenerate and furnish the most formidable of destructive results.

Etiology.—The exciting causes of carcinoma are unknown. The various theories relate to cell inclusion, parasitic disturbance of the proper relations of growth and functional activity, and congenital tendency of the cells.¹ The forms supposed to be etiologically related to Paget's disease, have been shown to be peculiarly metamorphosed epithelium.

The predisposing factors in carcinoma include trauma, whether mechanical or chemical, as immediate excitants of the pathological process in the predisposed skin. In this way warts, nevi, the lesions of lupus and syphilis, though not in themselves cancerous, may when provoked inaugurate the disease. In this way, too, the irritation produced upon the lips of the smoker by his pipe or tobacco; the local disorder about the inner canthus of the eye resulting from occlusion of the lachrymal ducts; the frequent teasing by caustic or other substances of the wart on an old man's hand; and other agencies

FIG. 140.



A relapsing rodent ulcer in scar tissue back of the ear with lymph node metastasis over the mastoid process. Owing to the dense cicatricial tissue the growth appears as fine processes and strands made up of small compressed cells more suggestive of connective tissue than epithelial cells (Fordyce).

disturbing the balance between waste and repair, aided at times by senile atrophic changes, may result in the development of an epithelioma. The danger of malignant changes in certain forms of kera-

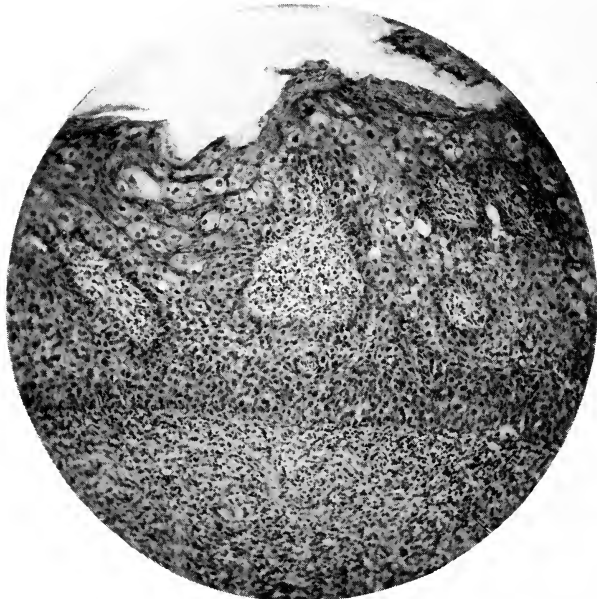
¹For a more complete discussion and bibliography see Macleod, "Pathology of the Skin," 1903, pp. 120-122.

toxis,¹ especially in later life, is recognized generally. The long-continued use of arsenic may be followed by hyperkeratosis and epithelioma.²

The possibility of the transmission of cancer by heredity has almost ceased to obtain credence in the light of modern pathology, yet Broca reports sixteen deaths from cancer in one family, and Freiderich a congenital epithelioma in the child of a cancerous woman.

The disease is eminently one of advanced life, being most frequent after the fortieth year, and a pathological curiosity in child-

FIG. 141.



Paget's disease of the buttock, showing the changes which take place in the epidermic cells. They are very much swollen from œdema, vacuolated, and have their nuclei pushed to one side. Many of them have lost their prickles. In the corium there is a dense infiltration of lymphocytes and plasma cells (Fordyce).

hood. Kaposi reports one case at the tenth year. Only about 30 per cent. of all cutaneous cases occur in women, a fact possibly explained by the relative infrequency of the action of local irritants in those who are not subjected to the exposures incidental to the trades and laborious occupations of life.

Pathology.—The carcinomas which are secondary in the skin may be dismissed with a word; their structure corresponds to that of the primary growth.

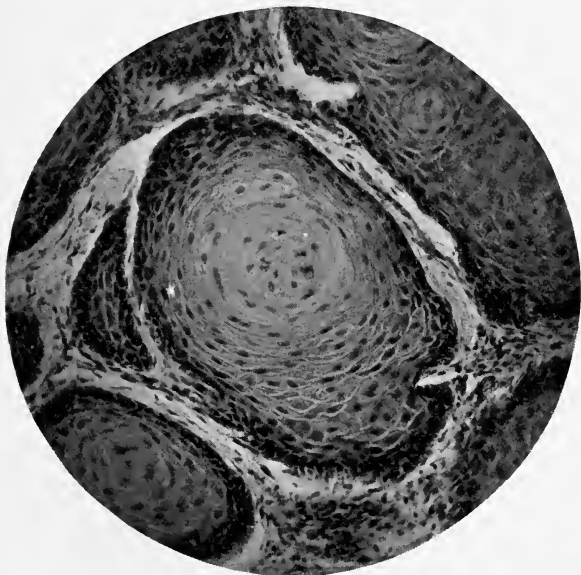
Primary cancer of the skin occurs in the squamous and the cylin-

¹ Cf. Hartzell, J. C. D., 1903, xxii., p. 393 (discussion before American Derm. Assoc. with bibliography).

² Cf. Darier, *Annales*, 1902, s. iv., iii., p. 1121 (references to literature).

drical-celled forms.¹ The squamous-celled type is at times described as originating from the orickle-cells which tend to become cornified and are of a less malignant nature; and the cylindrical-celled form as arising from the basal cells, not going on to cornification and being

FIG. 142.



A cancer of the leg, of the prickle or squamous cell type. Photograph shows cross sections of epithelial processes which have a concentric arrangement, their centers undergoing pearl-formation (Fordyce).

of a more malignant type. Borrinan² speaks of the latter variety as carcinoma of the corium, for the lesions develop in the subdermal stratum.

The squamous-celled form consists of solid cords of epithelium which, in the growth, invade the underlying tissue and in some cases, pile up above the skin level. The growth originates in the cells of the rete Malpighii. The layers of the epithelial rods, concentrically arranged, with the germinal cells at the base and the cornified cells at the center form, on section, the characteristic onion-like bodies known as epithelial pearls or nests. The parasites described as associated with these tumors, are no more than cells which have undergone hyalin and corneous changes. The so-called giant-cells are single multinucleated bodies or several cells fused into one.

The cylindrical-celled variety arises from the cutaneous appendages, as a rule, probably from the sweat glands, and differs from the other type in its tendency to form gland-like structures.

Though differing histologically, both forms are alike in that they

¹ Macleod, "Pathology of the Skin," p. 115 et seq.

² Ibid.

similarly invade the basement membrane and tissues where they do not normally exist. In their growth they excite, as a rule, an inflammatory reaction in the form of a round-celled infiltration. Upon the amount and strength of the connective tissue arising from this inflammatory reaction which is the safe-guarding barrier depends altogether the malignancy of the tumor.

These carcinomas in their subsequent growth invade the contiguous tissues, sparing none of the lymph channels, and finally, if death

FIG. 143.



Cylindroma.

An epithelioma of the basal-cell type removed from the face. Hyaline degeneration of the interior of the tumor has resulted in the lace-like appearance. The tumor cells are small with chromatic nuclei and very little protoplasm. The connective tissue shows an inflammatory reaction (Fordyce).

does not supervene from other causes, form general metastases, the structure of which corresponds to that of the primary growth.

Diagnosis.—The diagnosis presents, as a rule, no difficulties. In those forms which are secondary the recognition of the primary tumor is conclusive.

In the primary forms, the etiologic factors must constantly be borne in mind. The history of the case and the patient's age are primarily important. Thus, an eczematous condition of the nipple in a woman past 35, which shows no tendency to heal under the usual measures, ought, *a priori*, to be considered carcinoma until otherwise proven by the microscope. Or, in a middle-aged man accustomed to the use of the pipe, a refractory ulcer on the lip must be looked upon as cancerous until the weight of evidence can be shown against this

diagnosis. Rodent ulcer, in particular, in its manifold early varieties, is apt to remain long unrecognized as cancerous.

Rodent ulcer has a benign course, is commonly found on the eyelids, nose, temples, and lips, does not give rise to metastases (though Fordyce¹ mentions a case with regional involvement), and above all, has the unmistakable pearly border previously emphasized. Those conditions upon which rodent ulcer is prone to develop, or which resemble it from the outset can often be differentiated only by the history and course, and conclusively, by microscopic section.

Lupus vulgaris is distinguished from rodent ulcer and other types of carcinoma of the face by its appearance, as a rule, in the young, by the "apple-jelly-like" border (seen with the diascope), and by the

FIG. 144.



Cylindroma of the scalp.

The cells of this tumor are small and closely resemble those of the basal layer of the epidermis. Inside the cellular aggregations hyalin degeneration has taken place in the form of small cylindrical areas, from which the growth derives its name. Immediately surrounding the cell-masses the connective tissue has likewise undergone degeneration, appearing as a narrow homogeneous band of hyalin (Fordyce).

other concomitant so-called "scrofulous" features—cervical adenopathy, adenoids and hypertrophied pharyngeal tonsils, dermatitis seborrhoïca, otitis media, etc.

The initial lesion of syphilis requires differentiation especially from rodent ulcer and carcinoma of the tongue and lip. The age of the patient (though advanced age by no means rules out chancre as hospital operative records not infrequently show), the history and

¹ Journal des Maladies Cutanées et syphilitique, 1901, s. vi., xiii., p. 106.

rapid appearance of the lesion, the recognition of *spirochaete pallida*, and the subsequent appearance of the secondary manifestations of syphilis (the necessity for waiting for which in order to rule out cancer should not as a rule be the case)—all of these points determine the diagnosis.

Secondary luetic manifestations can scarcely cause confusion.

Tertiary lesions are recognized by the anamnesis, by their multiple character; the tubercular form by its serpiginous outline with

FIG. 145.



Carcinoma of the ear.

tubercle-studded border, by the finding of characteristic scars, by the therapeutic test (which should be given a convincing but not dangerously long trial) and, if necessary, by the microscope.

Syphilitic involvement of the penis, breast, and other parts are distinguished by the same criteria.

The patch of blastomycosis does not present an indurated edge; and forms fungous-like masses with miliary abscesses at the periphery which always show the specific organism.

Paget's disease of the nipple is differentiated from eczema by the age of the patient, the progressive growth with no period of improvement, the sharply indurated limiting border, the lack of itching, and later by nipple retraction, rapid growth, and glandular involvement. The microscope may be necessary in doubtful cases.

Treatment.—Conspicuous in the recent contributions to the subject of carcinoma of the skin stands the employment of *x*-rays. It has been shown to be the therapeutic agent of choice in rodent ulcer, Paget's disease, and other superficial forms, when the condition is not hopeless.

Since Stenbeck, in 1899, exhibited a patient from whom he had removed a rodent ulcer by the use of the *x*-rays,¹ the value of the method in certain types of cutaneous carcinoma has been established by the reports of a large number of observers.

The results obtained in our years of experience with *x*-rays in the treatment of cutaneous carcinomata are extremely satisfactory. The exceptions are those cases in which regional metastasis has occurred and the cases where the growth involves the lower lip, and in some of those involving the tissues of the ear. When the carci-

FIG. 146.



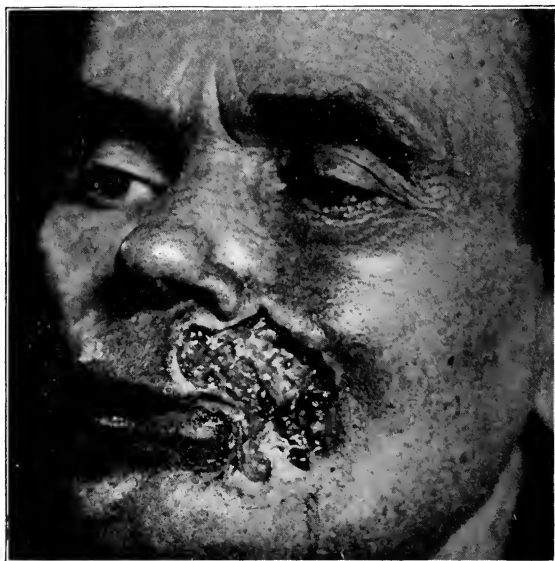
Epithelioma.

noma involves the lower lip excision should be advised except in the most superficial varieties; where the growth involves the tissues deeply about the cartilages of the ear it is very resistant to *x*-rays and in

¹ Cf. Pusey, *The Röntgen Rays in Therapeutics*; Williams, *The Röntgen Rays in Medicine and Surgery*; Freund, *Grundriss der Gesamten Radiotherapie*, Vienna, 1903; Allen, *J. C. D.*, 1903, xxi., p. 75; Sequeira, *Brit. Med. Jour.*, June 6, 1903; Hyde, Montgomery, and Ormsby, *J. A. M. A.*, January 3, 1903.

the majority of such cases excision followed by radiotherapy is probably the best procedure. With these exceptions the method gives ex-

FIG. 147.



Carcinoma of lip.

cellent results. (For description of apparatus consult the chapter on Radiotherapy.

In a given case the treatment is given, as a rule, daily, or on alter-

FIG. 148.



Epithelioma of the ear.

nate days. The average time consumed during treatment and recovery is two months. With the surrounding tissues properly protected

with lead, exposures are made with a medium hard tube, its quality, however, varying with the depth of the growth. The distance of the target from the lesion varies from four to ten inches. The time occupied for each exposure is three to ten minutes. Treatment is suspended usually on the first appearance of reaction, and resumed, when necessary, after the latter has subsided.

The chief advantages of radiotherapy lie in its painless application and excellent cosmetic results. It should be the method of choice in all superficial cases which, owing to location or to large areas involved can not be treated surgically without conspicuous disfigurement. The treatment is of special value in diffused hyperkeratoses and senile skins showing beginning malignant changes. For practically all superficial lesions the method is satisfactory, but for circumscribed lesions more time is required than in simple excision. In deep-seated tumors, though radiotherapy is often successful if the growth be fully

FIG. 149.



Carcinoma of the lip.

exposed to the surface, it is better to remove surgically as much of the tumor as possible and follow with the *x*-rays. In deep-seated lesions beneath the unbroken integument, and especially those situated about the neck, we have had no success whatever further than relieving pain and temporarily retarding the growth.

Destruction of smaller cancerous tumors of the skin may be performed with the aid of caustics, of which potassium hydroxide, in stick or in solution, is perhaps the most valuable, as its destructive action may be controlled by the topical employment of acids, and it is

followed by less pain than are some of the other chemical agents. Other caustic substances employed for a similar purpose are: zinc chloride, Vienna paste, silver nitrate, arsenical paste, resorcin, fuchsin, and pyrogallol. The latter is highly recommended by Kaposi,

FIG. 150.



Epithelioma of the cheek.

not only because its application is unproductive of pain, but also because it does not attack sound tissue. It is used in an ointment of 10 per cent. strength. All such pastes and ointments should be spread upon cloths, and be applied for from three to six days. Opiates may be required, in the case of several of these agents, to relieve the consequent pain.

Among the formulæ used for caustic purposes are the following:

R	Creasoti,	3ss;	15	
	Acid. arsenos.,	gr. iv;		266
	Opii pulv.,	gr. ij;		133 M.
Sig.	For employment upon circumscribed surfaces. [Kaposi.]			

Marsden's paste, also employed as a caustic, is made by combining equal parts of gum arabic and arsenous acid with water sufficient to make a softish paste. By Robinson¹ it is preferred to others, and is applied on rubber plaster.

Cosmè's paste, as modified by Hebra, is prepared as follows:

R	Acid. arsenos.,	gr. vj;	40	
	Hydrarg. sulphuret. rub.,	3ss;	2	
	Unguent. aq. ros.,	3ss;	15	M.
Sig.	Arsenical paste for external use, with caution.			

The method of its application is as follows: the paste is spread over a thin sheet of lint to the thickness of a knife-blade, and the lint is then cut to a shape and size corresponding with those of the tumor

¹ "Treatment of Cutaneous Malignant Epitheliomata," Internat. Jour. of Surgery, 1892, p. 179.

or ulcer to be destroyed. After its close apposition with the surface to be attacked the lint and paste should be covered with gutta-percha or other impermeable tissue, and a compress laid over the whole. In twenty-four hours the dressing is removed, the parts washed clean, and the same application renewed. By the third or the fourth day the destruction of the cancerous growth is usually complete, and the parts are ready for an emollient poultice, which should be applied for the three or four days during which separation of the slough occurs. The simple ulcer left is to be treated on general principles. The danger of arsenical poisoning is here reduced to a minimum; the treatment is very effectual where patients consent to the delay as to time and to the severe pain which it occasions.

The thermo- and galvano-cautery may also be often advantageously used for destruction of the growths. The advantages of the thermo-cautery are: the transitory character of the induced pain; the coal-like dressing left upon the attacked surface; and the elegance of the resulting scar. Both measures find their highest value when employed after incision or erosion.

Whatever method be employed, thoroughness is essential in attacking all portions of the new-growth; and it is well to encroach somewhat upon the unaffected contiguous structure. The subsequent dressings should be made with simple or carbolated unguents, to which one of the salts of morphine may be added in case of continuous pain. The eschar usually separates in the course of a few days, leaving a simple granulating wound which may soundly cicatrize, and the epithelioma be thus radically relieved. In other cases the disease reappears in the ulcer or cicatrix, or, by recurrence of cancerous nodules, in the previously sound integument. Even after these recurrences prompt destruction of the new-growth may finally be successful.

But little confidence is placed upon any external treatment which does not effect complete destruction of the neoplasm. Yet there are those who highly esteem some of the procedures which are less radical in their aim, and which it is proper to mention here.

Levêque, Vidal, Bergeron, Euthyboule, and others claim large success in the treatment of epithelioma by potassium chlorate. Locally, the part is frequently touched with a saturated solution of the salt in glycerin and warm water, after which a simple ointment-dressing is applied. Vidal administers also the same drug internally in doses of $1\frac{1}{2}$ drachms (6.) in syrup and water before meals. It is possible that any remedial effect obtained from such measures should be attributed to the fomentations employed. Latterly, benzole and pyoktanin-blue have been reported as valuable topical applications to small-sized epitheliomata.

Injections of solutions containing cupric sulphate, iodine, alcohol, acetic acid, silver nitrate, sodium chloride, and hydrochloric acid have been practised, it is claimed, with some success; certainly at times with fatal results. This method is unquestionably inferior to others described above.

Prognosis.—In general, the prognosis of cutaneous cancer is grave. The relative degree of gravity largely will be proportioned to the variety, form, size, career, and complications of the growth in each case. The variety in which only “pearls” form in the skin is the most benign, as the lesions are usually isolated, and may, when unirritated, undergo spontaneous exfoliation. In other cases the disorder for from fifteen to twenty years seems to make no progress of any sort. The malignity of a cancerous growth is usually proportioned to the quantity of epithelium as compared with the connective tissue present; the more abundant the latter, the more favorable the prognosis. Naturally, also, the deeper and the more destructive the growth, the fewer are the chances of ultimate recovery. Excessive pain and adenopathy are unfavorable symptoms in any case. Koch gives statistics of the results of operations, at the Erlangen Clinic, for the removal of epitheliomata of the lower lip, in one hundred and thirty-one patients exhibiting primary lesions. One hundred and fifteen of these were for the time “cured”; four had speedy relapse; and three were, at the date of writing, suffering from recurrence of the disease.

The superficial types—especially rodent ulcer and Paget’s disease—when recognized early and appropriately treated offer by far the best prognosis.

CLASS VII.

SENSORY DERMATO-NEUROSES.

A number of skin-diseases are more or less dependent on neuropathic conditions, and could probably be classed as sensory, motor, vasomotor, or trophic dermatoneuroses. Morris¹ and Leloir,² and a few others attempt such a classification; but in the large majority of these dermatoses the neuropathic element is not so well understood as are some other features. In this chapter are considered only the sensory dermatoneuroses, that is, those disorders in which there is disturbance of sensation without other recognized changes in the skin.

These purely sensory dermatoneuroses are commonly described under four headings: hyperæsthesia, anæsthesia, dermatalgia, and paræsthesia (including pruritus).

Bronson³ calls attention to the fact that cutaneous sensation is complex and made up of a number of elements which he describes as common sensation (or mere subjective feeling), including the sense of pain; the sense of temperature; the sense of touch, including the pressure-sense and the sense of contact; and a special sense of a higher order, which is exercised in feeling for or of a definite object, and which he terms the sense of *Pselaphegia*. This sense includes and is dependent upon the preceding elements, and is ranked with the special senses of seeing, hearing, and smelling. Any one of the above named senses may be exaggerated, defective, or perverted, while the others remain normal, or all may be involved simultaneously.

HYPERÆSTHESIA.

(Gr., *ὑπέρ*, above; *αἰσθησις*, sensibility.)

Hyperæsthesia is an exaggerated sensitiveness to external impressions. In this condition the abnormal sensations are aroused by contact with an external body, and do not arise spontaneously, as in dermatalgia and in paræsthesia. The distinction between these conditions may often be difficult to recognize, since two or more of them may coexist; or the hyperæsthesia may be so excessive that the slightest unrecognized current of air is sufficient to produce a marked sensation. Finally, in some forms of hyperæsthesia abnormal sensations may result from irritation due to mental or emotional causes.

¹ Diseases of the Skin, London, 1898.

² Twentieth Century Practice, vol. v., p. 749.

³ Morrow's System, vol. iii., p. 725; and N. Y. Med. Record, Oct. 18, 1890.

It is evident that this last type of hyperæsthesia can be differentiated with difficulty, if at all, from paræsthesia.

Cutaneous sensation may be exaggerated as a whole, but the senses most commonly involved are those cognizant of contact and common sensation, including the sense of pain. In mild cases there is merely an unusual sensitiveness to contact with foreign bodies, such as the clothing, but in severer forms the light touch of a feather or slight currents of air over the skin may be almost intolerable. In the condition known as *Hyperalgesia* the sense of pain is greatly exaggerated, while the sense of touch is diminished. As a result, the slightest contact with an object causes great pain, but the nature of the object causing the pain is not recognized so distinctly as in health. In some instances it is the temperature-sense alone that is involved, as a result of which the surface is exceedingly sensitive to cold, or, more rarely, to heat.

Hyperæsthesia, involving one or all of the senses mentioned above, may be mild or severe, and may be limited to restricted areas, as in tabes or leprosy; to certain regions or to one side of the body, as in hysteria; or it may affect the entire surface, as in disease of the cord, in neurasthenia, and in other disorders of the nervous system.

The causes of hyperæsthesia are found in various functional and organic disorders, central or peripheral, of the nervous system.

In connection with the hyperæsthesiæ may be mentioned a condition which cannot be considered pathological in itself, though it is often dependent upon pathological states. Reference is made to the unusual development and acuity of the touch-perception, or sense of pselaphesia, as a result of which contact with a foreign body gives the perceptive centres a more delicate and complete impression of that body than would normally be obtained. This unusual sensitiveness of the touch-perception is seen frequently in the blind, and may even be cultivated. It occurs also in the hypnotic state; in intoxication from alcohol, or from cannabis indica; in hysteria and some other mental and nervous disorders; and in conjunction with the other forms of hyperæsthesia.

Treatment is that of the nervous disorder upon which the hyperæsthesia depends.

DERMATALGIA.

(Gr., *δερμα*, skin, and *αλγος*, pain.)

(NEURALGIA CUTIS.)

In this morbid state the integument becomes the seat of painful sensations, which may or may not be associated with a hyperæsthetic condition. This disorder is much more frequently partial than general, being in the larger number of cases a local expression of some disease of the nervous centres or tracts. It is observed usually in middle life, and in women more than in men. Its symptoms vary in severity from a slight burning to a state of torture that defies de-

scription. In character the pain is differently described as comparable to that produced by friction, incision, penetration, contusion, or burning of the integument, as also to the passage over the part, of streams of very hot or of cold water, or the electric current. With this there is commonly associated an undue sensitiveness to contact with foreign bodies. The skin presents no objective signs of disease. The disordered sensations may be limited to the scalp, the region of the spine, or the palmar and plantar surfaces. In the latter situation it is often significant of some obscurely developed systemic disease, such as syphilis, rheumatism, or locomotor ataxia. In a middle-aged woman a persistent dermatalgia of the interscapular region was associated with confirmed gastric dyspepsia. In other cases the disorder is dependent upon disturbance of the uterine function. It is occasionally observed as one of the rare signals of the occurrence of the menopause.

It is to be noted that the severe dermatalgia associated with disorders of the uterus in women is occasionally succeeded by a cutaneous lesion. In a middle-aged dysmenorrhœic patient under observation a pea-sized hemorrhagic bulla appeared over the forehead after several weeks of frontal suffering. Buck¹ also reports dermatalgia of the brows and wrists in a young woman who had frequently miscarried followed by recurrent formation of a vesicle which accomplished its career of rupture, crusting, and erosion in a stadium of from five to seven days.

Diagnosis.—The disease is to be differentiated from hyperæsthesia of the skin, with which it frequently is associated and from which it often cannot be distinguished with certainty, as it is not possible always to exclude slight sources of external irritation; and further the diagnosis must be based largely upon the observations and statements of the patient. Painful affections of deeper parts, muscular, nervous, aponeurotic, and visceral, must also be excluded. Severe pain limited strictly to the skin of the lumbar region, with hyperæsthesia, may precede the occurrence of perinephritic abscess.

Treatment.—The treatment is to be directed to the disorder of which, in the great majority of cases, the dermatalgia is merely a local symptom. Quinine, the salicylates, iron, arsenic, and zinc phosphide are often indicated. Temporary relief, however, may be afforded by the local application of a rubber bag filled with very hot or very cold water; sometimes by an alternation of the two, each for a few moments at a time. Sponging the part with very hot water is also useful, continued for longer periods, and followed by swathing in cotton-wool covered with Lister protective. High frequency currents over the cord are often of special value. In some cases anodynes may be used topically with advantage; especially cocaine, opium, aconite, belladonna, or stramonium in oily combinations. In other cases relief is had by painting the parts with Squibb's mercuric oleate and morphine. The skin should generally, in the interval of applica-

¹ Phila. Med. and Surg. Reporter, 1881, p. 677.

tion, be protected by a dusting-powder; and the clothing worn next the skin should be of an unirritating character.

CAUSALGIA is a term chiefly employed by Weir Mitchell, to designate a sensation of burning and pain, with tenderness, occurring in different regions of the integument affected with "glossy skin." The sensitive area in these cases, is supplied by the filaments of a single nerve.

Causalgia is distinguished from the pain of neuralgia, sciatica, etc., by the localized affection of the skin which is the seat of the abnormal sensation; and from the pains of rheumatism by the absence of the muscular soreness accompanying this last. In the gouty state with erythematous areas, often shining, over the painful joints, the recognition of any distinction might be attended with difficulty. In pruritus, the itching sensation is invariably the predominant symptom.

MERALGIA PARESTHETICA.¹

(Gr., *μερος*, a part.)

Under this title Dr. James C. White² describes one of the conditions due to derangement of sensibility in the skin where the region of the disordered sensation was strictly limited to a portion of the surface of the left thigh. The patient was fifty-five years of age and had suffered for six months from abnormal sensations in the skin of the region invaded, first appreciated after active exercise in walking.

The perverted sensations were described as "tingling like that produced by striking the 'crazy-bone,' tensity as in tearing, formication, the sensation of the bursting of a bubble, dull deep aching pain of fatigue." The sensations were increased in the recumbent position, when the limb was over-stretched or strained, and when it was deeply impressed with the hand. On the production of artificial hyperæmia, the part became congested in a purplish hue, receding more slowly than on the opposite side. The entire area was found, on testing with the point of a needle, less responsive than the corresponding part of the other limb; and there was complete anæsthesia above the patella. The author did not suggest any remedies for the control of the disease.

ERYTHROMELALGIA.³

(Gr., *ερυθρός*, red, and *άλγος*, pain.)

(THE RED NEURALGIA.)

Under this title Weir Mitchell in 1872, and later in 1878 and 1897, described a chronic disorder in which one or more portions of

¹ Bernhardt, *Erkrankungen des peripherischen Nerven*, 1895; Oppenheim, *Nervenkrankheiten*, 1905.

² J. C. D., 1906, xxiv., p. 160.

³ Bibliography: Arcangeli, *Monatshft.*, 1905, xli., p. 646. Auché and Lespinasse, *Rev. de méd.*, Paris, 1889, p. 1049. Baginsky, *Verhandl. der Berl. med*

the surface of the body, particularly over the extremities became the seat of pain, redness, and local elevation of temperature. Since then Graves, Raynaud, Paget, Vulpian, Eulenberg, Dreschfeld, Mackenzie, and others have described cases more or less allied to the type originally depicted.

Symptoms.—The symptoms are developed usually in persons of early middle age, in men more often than in women, particularly in those who are engaged in physical labor requiring an erect posture. After a variable period of malaise or suggestions of ill-health, a burning pain occurs in one or more parts of the local extremities, made worse by posture and movement but commonly relieved in the recumbent position. The sensations are those of burning and pain which recur with exaggeration after prolonged exertion in the erect posture and are soon followed by redness over the fingers, the toes, the heel, and external or inner face of the foot. One or all digits and one or all members may be involved. The arterial pulsation becomes excessive and the veins distended, with throbbing of the part. The hyperæsthesia may be excessive to both heat, cold, and pressure; the reflexes are normal or exaggerated; the surface-temperature of the parts affected rises two or three degrees above the normal; the swelling is slight; sometimes there is pitting on pressure. All symptoms are relieved by rest and cool applications.

In some cases the hands as well as the feet are involved and pains occur in the head, neck, shoulders, elbows, and other parts. In other cases instead of redness, the parts exhibit a special pallor. Mitchell lays great stress in diagnosis on the color of erythromelalgia, rosy red, later purplish red, as distinguished from the livid red in Raynaud's disease. In some cases vesicles form; in others pinhead-sized nodules; in yet others the subcutaneous tissue is indurated; the finger-

Gessellschaft., 1892, p. 241. Bury, Judson, Treatise on Peripheral Neuritis, 1893, p. 386. Collier, James, Lancet, Aug. 13, 1898. Dehie, Berl. klin. Wochenschr., 1896, p. 817. Edinger, Neurolog. Centralb., 1893, p. 657. Engelen, Abstr. in Monatshft., 1908, xlv., p. 555. Eulenburg, Verhandl. der Berl. med. Gesellschaft, Erster Theil, 1892, p. 239; Neurolog. Centralb., 1893, p. 657. Fränkel, Wiener klin. Wochenschr., 1896, pp. 147, 170. Gerhardt, Berl. klin. Wochenschr., 1892, p. 1127. Graves, Clin. Lect., vol. ii., p. 586. Hann, Abstr. in Monatshft., 1908, xlv., p. 555. Henoch, Berl. klin. Wochenschr., 1892, p. 1146. Henry, F. P., Journ. of Nerv. and Mental Dis., 1890. Koch, Berl. klin. Wochenschr., 1892, p. 1146. Landgrat, Berl. klin. Wochenschr., 1892, p. 1146. Lewin and Benda, Berl. klin. Wochenschr., 1894, p. 53. Machol, Berl. klin. Wochenschr., 1892, p. 1319. Mackenzie, Stephen, Brit. Med. Journ., 1879, ii., p. 704. Mitchell, Weir, Phila. Med. Times, 1872, pp. 81, 113; Amer. Journ. of Med. Sciences, July, 1878, p. 17; Clinical Lessons on Nervous Diseases, 1897, p. 177. Morel-Lavallee, Bull. Soc. Franc. de Dermat. et Syph., Paris, 1891, ii., p. 354. Morgan, Lancet, Jan. 5, 1889. Paget, St. Barth. Hosp. Rep., 1871. Pezzoli, Wiener klin. Wochenschr., 1896, p. 1263. Prentiss, Trans. Assoc. American Physicians, Phila., 1897, p. 303. Rolleston, Lancet, 1898, p. 783. Ross, Diseases of the Nervous System, 1883, vol. i., p. 662. Seeligmüller, Lehrbuch der peripheren Nerven und des Sympathicus, Bd. v., p. 37. Senator, Berl. klin. Wochenschr., 1892, p. 1127. Sigerson, Progrès Médical, 1874, pp. 229, 246. Strauss, Soc. méd. des hôpitaux, March, 1880. Sturge, Allen, Trans. Clin. Soc., 1879, xii., p. 156. Thoma, Archiv für patholog. Anat., 1883, xciii., p. 496. Idem, Deutsches Archiv für klin. Medicin, 1888, p. 409. Vulpian, L'appareil vasomoteur, vol. ii., p. 623. Woodnut, Journ. of Nervous and Mental Diseases, Oct., 1884, p. 627.

ends become tense and shining; or there is clubbing and thickening of the nails. In extreme cases the muscles of the limbs have become somewhat wasted, probably from disuse of the limb.

Etiology.—Some patients are unquestionably hysterical; in others there are definite indications of paralysis; in yet other cases, there are signs of cerebral weakness (immobile pupils, exaggerated reflexes, and mental hebetude). Few cases occur in early life, although patients aged sixteen to twenty have been recorded; the most are males in middle life who have been engaged in heavy labor in varying temperatures. Traumatism seems to have been effective in a few cases.

Pathology.—It is now generally believed that the disease is produced by a peripheral neuritis, although in two cases recorded careful examination of resected nerves resulted in the discovery of nothing abnormal. Arteriosclerosis, even of the smallest arteries, is responsible for some of the conditions named above.

The disease has been found to result from trauma (in one instance after a railway accident); and to concur with paralysis, Graves' disease, tabes, multiple sclerosis of the cord, alcoholism, osteomalacia, and myelitis. The morbid condition is rather a symptom-complex than a malady *sui generis*, the external phenomena being due either to central or peripheral irritation, inducing either functional or organic change.

Intermediate cases between erythromelalgia and Raynaud's disease have been recorded by a number of observers (Morrell-Lavallée, and others).

Treatment.—The best results are secured by long rest in the recumbent position; faradization of the nerve centers; high frequency currents; cold applications during paroxysms, when required; and a nutritious dietary. Nerve stretching and nerve excision have been followed by questionable results.

Prognosis.—The patient exhibiting these symptoms are rarely improved by treatment, the disease often progressing for years with gradual aggravation of the symptoms. The few cases of recovery are important. Excision of a portion of the tract of the nerve and stretching in others have been found of questionable value.

ANÆSTHESIA.¹

(Gr., *a*, privative; *αἰσθησις*, sensibility.)

In cutaneous anæsthesia one or all of the elements of cutaneous sensation may partially or wholly be lost. It may be due to central or peripheral causes involving the nerves.

¹ Literature: Impens, Über Lokalanästhesie (5 papers on Alypin). Dtsch. med. Wochenschr., 1905, Nr. 29; Seifert, *ibid.*, 1905, Nr. 34; W. Seeligsohn, 1905, Nr. 35; E. Stotzer, Dtsch. med. Wochenschr., 1905, Nr. 36; Max Joseph und Joseph Kraus, Dtsch. med. Wochenschr., 1905, Nr. 49; Monatshft., 1906, xlii., p. 583; Chiene, Observations on the use of Euaine B and Adrenalin as a means of Inducing Local Anæsthesia. Scott, Med. & Surg. J., 1904, p. 215; B. J. D., xvii., 1905, p. 154.

Analgesia, or insensibility to pain, may exist while the tactile sense remains unimpaired, or the reverse may be true. *Thermo-anæsthesia* may alone be manifested, and sometimes is limited to heat alone or to cold alone. A curious illustration of this occurred in the person of a leper, whose hands were in all parts sensitive to the prick of a lancet and to contact with heated substances; yet who exposed them for hours without protection to an atmospheric temperature of ten degrees below zero without even slight discomfort.

The tactile sense is involved more frequently than in hyperæsthesia, and usually is absent in all cases of anæsthesia. It, however, may be retained unimpaired with loss of one or all of the other elements of cutaneous sensation, as sometimes occurs in anæsthetic leprosy or syringomyelia. The failure to appreciate some one or more properties (such as form, size, weight, density, and smoothness or roughness) of foreign bodies may be psychical in origin.

Illustrations of cutaneous anæsthesia are furnished in the anæsthetic patches of leprosy, which may or may not exhibit textural skin-changes; centric and eccentric paralyses; syphilitic, hysterical, and ataxic disorders; partial or complete anæsthesia of artificial production; the several toxic narcoses; traumatism of nerves by pressure, wound, or contusion; the local anæsthesia induced by cold, frigorific mixtures, and substances capable of benumbing the sensitiveness of the skin; coma, of whatever origin; and a number of idiopathic cutaneous disorders, including several of the atrophies, scleroderma, and morphœa.

The substances chiefly employed for the production of local anæsthesia are ice, ethyl chlorid, ethyl bromid, methyl chlorid, eucain B, adrenalin, and alypin.

PARÆSTHESIA.

In paræsthesia there is a perversion of sensibility, as a result of which a given stimulus produces a sensation different from that which it would produce in health. One or all of the elements of cutaneous sensation may be involved. Contact with a warm object may give a sensation of cold or of pain. Derangement of the tactile sense may give erroneous impressions of the size, weight, roughness or smoothness, firmness, or other qualities of an object. Many other perversions of sensation occur, all dependent upon central or local disorder of the nervous system. Sensations may be delayed for some seconds after contact, or many persist after the latter has ceased.

There may be an error of location, as when the patient refers the point of contact to the wrong place or to the wrong side. The paræsthesia may be largely or wholly subjective, and frequently gives rise to the sensation of heat or cold, formication, tickling, dripping or pouring of liquids of various temperatures, etc.

PRURITUS.¹(Lat., *prurire*, to itch.)

Symptoms.—Pruritus is a common form of paræsthesia which is to be distinguished not only from prurigo, a rare disease of the skin already described, but also from the symptomatic sensation of itching which is occasioned by a number of cutaneous disorders, such as eczema, scabies, and the dermatoses produced by pediculi.

Hebra was first to recognize the independent character of the disease here considered; but it is to be regretted that he did not give to it a name distinct from that which is also applied to a symptom common to several maladies of the skin.

Pruritus is characterized by a sensation of itching not produced originally by cutaneous lesions. It may be general or be partial. In either form it begins usually by a tickling, pricking, crawling, or itching sensation in the skin, which solicits the sufferer to rub, press, scratch, or otherwise irritate the affected integument. It usually occurs by accesses in the day or the night, much more often the latter, occasionally both; and these accesses most frequently occur under the immediate stimulus of some internal or external cause. Thus, moral emotions, a draught of cool air, the warmth perceived when in bed, the pressure of clothing, and often the substances applied externally with a view to the relief of the pruritus, suffice to determine a crisis. However firmly the sufferer may determine to avoid injury to the person, in well-marked cases the impulse to scratch becomes well-nigh irresistible and in the highest degree tormenting. From the milder, the patient will thus frequently be teased to inflict the severer injuries upon the skin. Brushes, combs, coarse cloths, and even metal instruments are employed in severe cases for the purpose of assuaging temporarily the local distress.

The objective cutaneous symptoms which may be presented are all secondary, and invariably result from self-inflicted injury. In some cases they do not appear, the statements of the patient being the sole basis for the recognition of the disease. This absence may be the consequence of unwonted self-control, or of the mildness of the malady, or of the transitory character of the lesions produced. Thus, the skin may be reddened during a nocturnal paroxysm under the manipulation of the sufferer, and the transitory hyperæmia disappear in the daytime when the skin is submitted for inspection. Not rarely however, the integument resents the treatment to which it is subjected, by displaying wheals, hyperæmic blotches, reddened papules, excoriations, characteristic "scratch-lines," and the minute blood-crusts which indicate that the papillary layer of the derma has been reached and slightly torn. Dermatitis in varying degrees, and even eczema, may result, and still further add to the subjective distress. Skins that for years have been the seat of a persistent pruritus leading to

¹ For fuller discussion of the subject and bibliography, see Jacquet, *La Pratique Dermatologique*, iv., p. 341.

traumatism of the epidermis frequently show smaller or larger areas of deep pigmentation. The lesions may simulate those of persistent urticaria or of prurigo.¹

Neurodermia.—Neurodermia or neurodermatitis is a name given by the French to certain cases reported by Leloir and others in which a pruritus was followed by a dermatitis not due to traumatism, and persisting for considerable periods of time, or until relieved by treatment directed to the condition of the nervous system. These cases are probably due to vasomotor or other neurotic disorders.

Senile Pruritus is a term often loosely applied to any form of the disease occurring in the aged, in whom it is very common. In the large majority of cases, however, careful search will disclose causes identical with those found earlier in life. Among the most common of these causes are: defective digestion, metabolism, assimilation, and elimination, with the resulting hepatic, nephritic, circulatory, arthritic, and neurotic disorders so frequently seen in those advanced in years. Senile pruritus proper is that form of the disease due to atrophic and degenerative changes in the skin and other tissues of the aged, and is practically remediless.

Pruritus Hiemalis and "Prairie Itch" are considered at the close of the chapter.

Bath-pruritus.—Stelwagon² describes cases in which an attack of itching or burning follows a bath. The pruritus lasts from a few minutes to an hour or more, and is limited usually to the legs and thighs, but may affect other parts of the body. We have seen several such cases. A mild degree of pruritus following the bath is not uncommon in certain individuals with sensitive skins.

The localized forms of pruritus, albeit the abnormal sensation is in them limited to certain regions of the body, may occasion fully as much distress as those in which a larger part of the integument is affected. They are of more frequent occurrence than the generalized forms. Pruritus of the anus, of the scrotum, of the vulva, of the vagina, of the scalp, of the nose, of the mouth, of the axillæ, are all localized forms of the disease, two or more of which may coexist or may develop in succession.

¹ Cf. Hartmann, Archiv, 1903, lxiv., p. 381 (bibliography). Also Veiel, Ein Fall von Pruritus cutaneus bei Erkrankung der Niere und Nebenniere, Archiv, 1906, lxxx., p. 59. Milian, Über Pruritus und Lichenifikation, verbunden mit tabes, Annales des Malad. vén., 1906, i., p. 321, abstr. Monatsh., 1907, xlv., p. 240. Milian, Le Prurit tabétique, Bull. de la Soc. méd. des hôp. de Paris, 1907, p. 991, abstr. Annales, 1908, s. iv., ix., p. 175. Klein, Zur radicalen Behandlung des Pruritus ani, Therapie der Gegenwart, 1905, abstr. Centralbl., 1906, No. 5, p. 138. Kromayer, Die Behandlung des Pruritus cutaneus, insbesondere des Pruritus ani, Dtsch. med. Wochenschr., 1908, No. 2, abstr. Monatsh., 1908, xlvii., p. 117. Joseph, Über Pruritus ani und Orthoformdermatitis, Wien. klin. therap. Wochenschr., 1906, Nr. 8, abstr. Monatsh., 1907, xlv., p. 390; Centralbl., 1906, No. 8, p. 238. Robin, Die Behandlung der Pruritusformen inneren Ursprungs, Journ. d. pratic., 1907, Nr. 10, abstr. Monatsh., 1907, xlv., p. 373. Mitchell, Universal itching without skin lesion; hematogenous urobilinuria; malarial poisoning; peculiar erythrocytolysis, Am. Jour. Med. Sci., Mar., 1907, p. 440. Ormsby, J. A. M. A., 1906, May 26, p. 1595. Kanoky, J. A. M. A., 1907, May 25, p. 1762.

² Phila. Med. Jour., 1898, ii., p. 863.

Pruritus Narium is a frequent symptom of irritation of the Schneiderian membrane. It is thus a common precursory or an attendant phenomenon of rose- or hay-asthma; and in some individuals announces the systemic effect after ingestion of opium and its alkaloids. It occurs also in children as a result of pediculosis of the scalp. It may result, further, from the irritation awakened by intestinal parasites.

Pruritus Genitalium is often an exceedingly severe and distressing affection. As the parts in question are apt to be rubbed and scratched in efforts to secure relief of the itching sensation, there may be produced orgasmic effects and pollutions, the moral results of which are degrading. The scrotum, the labia majora and minora, the penis, the clitoris, and the adjacent cutaneous and mucous surfaces may be the seat of the pruritus. Search should always be made in these cases for ascarides of the rectum or of the vagina, for saccharine and albuminuric urine, and uterine or ovarian affections. A perverted sexual hygiene may lie at the root of these disorders. In severe cases the violence with which the parts are attacked suggests frenzy on the part of the patient, who at times is never content until the scrotum or other parts are bathed in blood. The thickening, erosions, and excoriations of the regions attacked are conspicuous features of the disease.

Pruritus Ani and Vulvæ are discussed in detail at the close of this chapter.

Pruritus Palmæ et Plantæ is a rare form of this disorder, in which the itching is limited to the palms and soles. It may complicate gout, malaria, hyperidrosis, and asthma.

Pruritus Lingvæ is reported in a few instances. It usually is due to a central neurosis, to glycosuria, or other systemic disease.

In all severe forms of pruritus cutaneus the general health perceptibly fails. Whether the prolonged insomnia arises from nocturnal exacerbations to which there are but few exceptions; or from the perversion of nutrition incident to the continuous teasing of the nervous system; or yet from the hypochondriacal state into which some patients are plunged by their sufferings, such an issue is often to be expected. It is, in fact, a complication that may merit, as much as the disease itself, the attention of the physician.

Etiology.—The causes of pruritus are numerous, and the necessity for the discovery of the particular cause in each patient often makes the largest demands upon the practitioner. The disease may occur at all periods of life and in both sexes, but its aggravated forms are peculiar to middle life and advanced years. It is always secondary to some disturbance of the nervous system. It is frequently the symptom of one of several internal disorders, such as malarial affections, tuberculosis, carcinoma of the viscera, disorders of the liver or kidneys (especially jaundice, Bright's disease, and diabetes), and disturbances of the alimentary canal, including those due to intestinal

worms, hemorrhoids, and dietetic or medicinal ingesta. It is common in the gouty, the rheumatic, the victims of alcoholism and the neurotic, and undoubtedly is due often to auto-intoxication. It is often reflex in character, and may be associated with almost every one of the functional, and not a few of the organic, disorders of the uterus and ovaries. The same may be said of its dependence upon the genito-urinary diseases of the male sex, including stone in the bladder, stricture of the urethra, disorders of the testes and epididymes, and perverted sexual hygiene. Through the reflex sympathy of one part of the skin with other regions it is not at all unusual for one point of pruritus to be the exciting cause of new foci of the disorder, even at some distance from the original seat of itching. A predisposing cause may often be found in hyperæsthesia either inherited or acquired (sometimes as a result of long-continued inflammatory dermatoses, such as eczema), as a consequence of which insignificant external irritants cause pruritus. Bronson¹ thinks a diminished tactile sense, which implies an imperfect conduction of sensory impressions, is often a predisposing cause.

The pruritus of tabetic patients is often characteristic and severe. It is more or less related to the severe girdling pain recognized both before and during the complete evolution of the disease.

Lastly, moral emotions of a depressing character play an important part in the etiology of pruritus. Mental distress occasioned by bereavement, separation from relatives, misfortune of all sorts, and anxieties as to the future, often find physical expression in the disease.

Pathology.—The disease is essentially a functional disorder of the nerves of sensation supplied to the skin, and of itself is incapable of producing objective symptoms. This fact can, in some cases, be clinically demonstrated, as the seat of the pruritus, even though exhibiting artificially produced lesions, will, when protected from external injury, speedily regain its normal appearance, the pruritus no less continuing. It is probable, though not certain, that the nerves also in this disease undergo no structural change, but merely convey to the periphery a perverted sensation that is often reflected from some centric point of disturbance.

Diagnosis.—The recognition of general pruritus is usually not difficult, though the secondary results of the disease are apt to be less characteristic than its early phenomena. The complaint of the patient, the absence of cutaneous disease sufficient to explain the symptoms, and especially the discovery of an efficient cause in some visceral or systemic disorder, are all significant.

One of the most constant features of general pruritus is visible only when the clothing of the patient is entirely removed. It then becomes evident to the eye that the affected regions are, in the order of frequency, those most accessible to the hands. The posterior are much less involved than the anterior body-surfaces. The small of the

¹“Etiology of Itching,” *Med. Record*, 1891, xl., p. 497 (a careful review of the subject).

back and interscapular regions are usually untouched. The tibial regions of the legs and the forearms suffer more than the calves and the upper arms. The lower belly and inner faces of the thighs are punished more severely than the breast and outer faces of the thighs and the hips. The clavicular regions are more excoriated than the back of the neck. There is no more diagnostic sign of pruritus than this, and it is one too often ignored by the practitioner, who prescribes under these circumstances for a "disease of the blood."

It must be admitted, however, that when the disease is localized and complicated, as it frequently is, by an eczema or a dermatitis, doubt may arise. Attention should then be paid to the history of the disorder, which may reveal the fact that the pruritus preceded for some time the cutaneous symptoms, and may disclose even more. Intelligent patients will often assure the physician of the real nature of the malady, by voluntarily remarking that the skin-symptoms disappear upon the region that is not scratched, though the pruritus continues. In all cases the influence of externally operating agencies should carefully be eliminated.

Prurigo, with its infiltrated skin, its primary papules, and its severe itching, beginning in early infancy and commonly persisting through life, can scarcely be confounded with pruritus cutaneus.

Treatment.—The degree of success to be obtained in the treatment of pruritus cutaneus is largely proportioned to the skill with which the cause of the disease is recognized and remedied. Taking into consideration the number of systemic and visceral disorders which may in different cases be responsible for the skin-symptoms, it is clear that an exhaustive study of the mental and physical history of each patient will be essential at the outset of treatment. The cause once recognized, the treatment should be directed to the special disorder discovered; and this largely requires the skill of the general practitioner. The gastro-intestinal tract, the kidneys, the liver, the bladder, the uterus, the prostate gland, the rectum, and indeed any one of the viscera, may require therapeutic management. All internal causes of cutaneous irritation should as far as possible be removed, and to this end attention should particularly be directed to any medication to which the patient may have been subjected, and which may have aggravated the complaint, and also to the diet, which should be regulated in accordance with the principles given under *Urticaria*.

In atonic conditions strychnine, iron, and other tonics are indicated. The nutrition of the nerves and of the skin can often be improved by the judicious use of cod-liver oil and other fats.

The attempt to relieve pruritus by the internal use of sedatives is to be commended only in extreme cases. The narcotics, while they may give temporary relief, tend to relax the skin and in the end to aggravate the disorder. This is especially true of the preparations of opium. The bromides, antipyrin, phenacetin, sulfonal, or even chloral may be given for brief periods in extreme cases, but always with the understanding that any one of these remedies, after tem-

porary relief, may aggravate the condition for which it was given. Furthermore, there are strong reasons for refusing to employ in pruritic disorders preparations containing opium, cocaine, cannabis indica, conium, and other drugs intended to relieve the subjective sensations by internal medication. Many well-nigh incurable cases of the "cocaine-habit" have been begotten by treatment of this sort when the patient, often a nervous woman with an intolerable pruritus vulvæ, is in a condition peculiarly susceptible to the action of remedies of this class. The latter should always be regarded as the last resort of the practitioner, and a confession of weakness in not discovering the special cause effective in the case with which he is for the time confronted.

Cathartics and laxatives and an abundant supply of pure water internally, employed as directed for relief of acute eczema, as well as diaphoretics and diuretics, are often of value in eliminating toxins to which pruritus may be due; in depleting the cutaneous vessels; and possibly in a reflex way by diverting irritation to other regions. Jaborandi and pilocarpine have thus been employed to advantage. In children full doses of quinine sometimes relieve pruritus, while in adults large doses of calcium chloride occasionally will accomplish the same result. Cannabis Indica and gelsemium at times are effective, but should be prescribed with great caution.

The indications for local treatment are to protect the skin from all sources of irritation and to relieve the itching. Hyperæsthesia of the skin is common in pruritus, either as a predisposing cause or as a result of long-continued pruritus. In consequence very slight external irritation may suffice greatly to aggravate the itching, and every precaution should be taken to protect the skin from exposure of all kinds. First in importance is the clothing. The garments worn next the skin should be of cotton, lisle-thread, linen, or silk, never of wool, and the meshes should be filled with an impalpable powder to reduce to a minimum the friction of the garments on the skin. All other clothing should be as light as possible and yet be warm enough for protection. If the patient live in a climate where sudden changes in temperature are common, the clothing should be regulated accordingly. The object is to keep the skin at an even temperature and to protect it from sudden changes. In cases in which the pruritus is due largely to the hyperæsthesia the itching may be entirely relieved by dusting the surface with a simple powder and completely covering it with a layer of cotton-wool or other protective dressing.

Hot baths, unless specially indicated, and the too free use of soap may render the skin unduly sensitive. The bran, oatmeal, alkaline, and other demulcent baths recommended in the chapter on General Therapeutics are those most generally useful. After the bath the surface should be patted (not rubbed) dry and covered with a dusting powder or other selected application. When the skin is free from excoriations and other lesions the cold douche, alternate hot and cold douching or sponging, or even the cold salt-water sponge may be

used to improve the tone and vigor of the skin. For localized pruritus hot baths of four or five minutes' duration, followed by drying and the immediate application of a protective dressing, are often grateful and beneficial. The water should be as hot as can be tolerated, and to it may be added borax or sodium bicarbonate.

Scratching is a common source of irritation and one that is difficult to set aside. Until this is accomplished, however, relief cannot be obtained, as wherever the skin is scratched or rubbed there is produced a local hyperæmia, or even a dermatitis, which adds to the cutaneous irritation, not only at the site of the rubbing, but also by reflex action in other regions of the body. It is not sufficient to tell the patient not to scratch; the surface must be protected by proper dressings, and the itching relieved by the use of antipruritics. Bronson suggests that patients be allowed to obtain relief at times by firmly pressing upon the surface or by gently drawing over it an oiled or a wet cloth.

The substances which have been employed topically for the relief of pruritus cutaneus are almost without number, a fact warranting the conclusion, corroborated in every wide experience, that each occasionally fails to afford the desired relief. That preparation, moreover, which is at one time of the highest value, at another period in the history of the same case will disappoint. Attempts to secure relief by such topical applications should, however, always be made, and will often be followed by gratifying results.

The sedative and antipruritic lotions, lead-water, lead and opium wash, liniments, and dusting-powders described elsewhere, together with their methods of preparation and application, are valuable and sufficient in most cases. They may be further modified by the addition of substances recommended in the following paragraphs. The dusting-powders are of special value in furnishing mechanical protection. When a decided antipruritic effect is desired the Anderson, or a similar, powder may be used. In some localized forms of pruritus more complete protection with ointments, pastes, or even the glycogelatins, may be secured.

Of all antipruritics, carbolic acid easily takes first place. In most of the lotions recommended above it is used in strength of 1 to 5 per cent. In oils or liniments it may be used much stronger. Bronson uses it even to 25 per cent., stating that it is much more slowly absorbed than in aqueous solutions, and therefore less likely to produce systemic effects. A favorite formula with him is the following:

R	Acid. carbolic.,	3j-ij;	4-8
	Liq. potass.,	3j;	4
	Ol. lini,	3j;	30
			M.

It is to be shaken before using, and may be scented with bergamot. These stronger preparations of carbolic acid, even in the oils, should be used over only small areas, for fear of toxic effects. The possibility of producing gangrene by the long-continued application of even weak solutions of carbolic acid should not be forgotten.

Other remedies that may be used in lotion, oil, liniment, ointment, or paste, in strengths varying from 1 to 5 per cent. or more are: salicylic acid, hydrocyanic acid, menthol, camphor, thymol, salol, creosote, chloral, and chloroform. Two or more of these remedies may be combined in the same lotion. Morphine, atropine, and cocaine may be added to lotions with occasional advantage.

Ointments and pastes are irritating to many pruritic skins, but at times are more acceptable than the lotions and oils. In abnormally dry skins and in some cases of bath-pruritus, a simple oiling of the skin often gives prompt relief.

Chloral-camphor, a pungent, syrupy liquid obtained by triturating an equal amount of the two substances in fine powder, is an anti-pruritic remedy of value in certain cases if applied in a salve containing 1 drachm (4.) to the ounce (30.) of salve, and is comparable in its action to phenol-camphor, described in the chapter on General Therapeutics. Among other remedies occasionally of service are ichthyl, resorcin, and mercuric chloride. Bronson speaks highly of hydrogen peroxide. The preparations of tar are not well tolerated as a rule, but in some instances are exceedingly valuable. The liquid preparations are to be preferred. In atonic cases, with diminution of the tactile sense, the use of electricity over the spine has been followed by good results.

In senile pruritus the progressive atrophy and degeneration of tissues may be checked or retarded by management proper to each case. Locally, electricity or hot and cold douches may aid in stimulating the skin to renewed vigor. Keeping the skin soft with daily inunctions of oil or a thin ointment is an effective measure in many cases.

Treatment of the regional forms of pruritus is that above described, with such modifications in the dressings as may be necessitated by the special location.

In ano-genital pruritus the hot bath described above at night is especially to be recommended. Fissures and areas of infiltration may be painted with compound tincture of benzoin or solutions of silver nitrate containing gr. x to ʒj (0.66-4.) to the ounce. The scrotum when attacked usually requires the use of a suspender, or suspensory bag, lined with soft lint or with borated cotton, which may be covered with a dusting-powder, wetted with a lotion, or smeared with an unguent.

Severe cases of vaginal, scrotal, and anogenital pruritus are best relieved by the *x-ray*. High frequency currents are recommended by some writers. We have found them of less value than the *x-ray*.

In the forms of pruritus due to hepatic disorders great relief is sometimes secured by surgical intervention. In Kanaky's case a cure was affected by removal of a stone from the common duct.

Lastly, many cases of intractable pruritus are best managed when the attention of the patient is diverted from the malady by the distraction incident to travel, aided by change of scene and climate.

Prognosis.—Pruritus senilis is usually an intractable disorder, and when dependent upon senile alteration of the cutaneous tissues is incurable. For all other forms of the disease a prognosis should be formulated with reserve. Under the influence of systematic and appropriate treatment the happiest results are often obtained. Other cases, especially those associated with hypochondriasis, may bid defiance to all medicinal measures. Relapse of the local forms of the malady, especially of that of the ano-genital region, is common. In many of these patients the treatment serves merely to palliate.

Pruritus Hiemalis (*Prurigo Hyemalis*, “Frost Itch,” *Winter Prurigo*).—Under the first title Duhring¹ described a harsh and pruritic condition of the skin, essentially unattended by structural alteration, invading all surfaces of the body, but chiefly the inner faces of the thighs, the calves of the legs, and the neighborhood of the joints of the lower extremities, usually occurring in the autumn and continuing until the following spring. It possesses many features in common with the forms of pruritus already described, including variability in the subjective sensations awakened, nocturnal exacerbation, and the absence of primary eruption. The secondary results are also similar, being sequels of self-inflicted injury in the form of roughness, perifollicular redness and papulation, torn and fractured hairs, excoriations, blood-crusts, and, in severe cases, an induced dermatitis. It however, abates in severity with a rise of atmospheric temperature, though there is occasionally noted persistence of the distress after such weather-changes. The affection, moreover, is one which occurs in persons otherwise enjoying perfect health, in those of every social grade, irrespective of the character of the clothing worn and of the habitual use or the neglect of the bath. It is, without question, a disease of northern climates, more particularly of those where the variations of temperature between the extremes of the summer and of the winter range between -30° and $+100^{\circ}$ F. The description by Duhring presents a picture (with an accuracy verified by clinical observation) which justifies the recognition of the disease as a form of cutaneous pruritus. Its treatment is that detailed above, the author named laying stress upon emollient unguents, glycerin in the form of lotion or ointment, and alkaline baths. The dusting-powders, when employed after the tepid bath, have proved more serviceable than any fat-containing substance.

Pruritus Ani.²—This disorder may be limited to the anus and ano-genital regions or be experienced over the neighboring parts (genital region, cleft of the nates, buttocks, and upper and inner parts of the thighs). It is a disorder of exceeding persistence when not properly

¹ Phila. Med. Times, January 10, 1874. See also a later but independent observation by Hutchinson: Lectures on Clinical Surgery, 1878, vol. i., pt. 1, p. 100; and Brit. Med. Jour., 1875, ii., p. 773.

² Adler, Lewis H., N. Y. & Phila. Med. Jour., lxxxii., 216, July 29; Hill, Boston Med. et Surg. Journ., 1906, cliv., 581; Rothschild, Dtsch. med. Wochen., 1906, xl.; Bouquet, Rév. Internat. Méd. et de Chir., Feb. 10, 1908; Dalche, Journ. de Méd. et Chir., Jan., 1908.

treated, and accompanied by local distress (itching, burning, etc.) of a severe grade. The parts in many cases are so deformed by scratching that excoriations, fissures, crusting, induration, pigmentation, and extensive thickening of the nates, as well as the several forms of eczema, may result.

The most severe types are seen in men, though both sexes are affected and the subjects are commonly those in middle or later life. Klein however reports the case of a twelve year old girl where the pruritus was so severe as to require the Pacquelin cautery for relief.

Etiology.—The causes are numerous including first, the gouty and alcoholic states, and afterward in order: superficial ulcers, either within the outer sphincter or about the anal orifice; impaction of feces; proctitis in various grades; hæmorrhoids, internal or external; abrasion, excoriation, or infection of the peri-anal sulci; chronic prostatitis; *fistula in ano*; sexual irregularities; and disease of the kidneys. Account must also be had of the possibility of intestinal worms, utero-ovarian disorders in women, and blennorrhagia of the rectum (a condition not so rare as is generally believed). Improper treatment has much to do with the aggravation of these symptoms. Joseph reports a severe orthoform dermatitis occurring in a patient affected with pruritus ani.

Treatment.—The local distress is often relieved by the withdrawal of the efficient cause as, for example, in the dyspeptic and the gouty; by securing relief from all rectal, urethral, and vaginal disorders; and locally by pencilling all fissures, excoriations, and cracks with nitrate of silver. Exception should be made here to the rule with regard to the exclusion of tars generally from the treatment of pruritus, as in the distressing itching of the scrotum and the anus they are often essential. The tincture of tar, oil of cade, and oil of white birch will here often be needed. In cases of exceptional severity, the hydrate of potash in twenty per cent. solution may be rapidly brushed over the surface and soothing pomades applied later, as in eczema of the anus (q. v.). In all extreme cases radiotherapy, cautiously employed, is followed by admirable results.

Pruritus Vulvæ.—This may be a disorder of mild grade or be productive of so much torture that after long deprivation from sleep and profound agitation of the nervous system, the unfortunate sufferers have been tempted to commit suicide.

Symptoms.—Like pruritus ani, that of the vulva may be limited to the genital region (mucous, muco-cutaneous, or cutaneous surface adjoining the latter, the outer faces of the labia majora, the labio-femoral clefts, and the perineum) or it may extend widely over the anus and neighboring parts. The tissues, from much scratching and rubbing, are usually tumid and dry rather than moist, are reddened in various grades, and often excoriated, crusted, torn, and in extreme cases affected with marked deformity. All the muco-cutaneous tissues, the labia minora, clitoris, and vaginal membrane adjacent may be swollen several dimensions beyond the normal.

Etiology.—The causes of pruritus ani are here also effective, including especially utero-vaginal discharges, fissures of the os tinæ following child-birth, and a long list of disorders peculiarly effective in the case of women, hysteria, neurasthenia, grief, unhappiness in the marriage state, carcinoma of the uterus, and as in Dalehe's case, kraurosis vulvæ. Glycosuria is a common cause.

Treatment.—The treatment involves chiefly the removal of the cause. Important considerations are the securing of normal urine, of daily alvine evacuations; great caution respecting the diet and mode of living; absolute cleanliness; and copious vaginal douches containing either a weak alkali or an aseptic solution such as two per cent. of acetate of lead, creolin, or carbolic acid.

In some cases the ointments are more valuable, one part of carbolic acid, for example, in twenty of benzoated oxid of zinc ointment; or what is often preferable, salicylic acid one part, to thirty of Hebra's white diachylon salve (*q. v.*); other remedies suggested are one part of the bichloride of mercury in five hundred of the emulsion of bitter almonds (Skene); one part of chloroform, and one of dilute hydrocyanic acid to twenty five of olive oil; one part of chloral-camphor (*q. v.*) with thirty of vaseline and ten per cent. solutions of argentum nitras.

For pruritus of the vulva Wiltshire¹ recommends decoctions of almond-meal, marshmallow, slippery-elm, and rice; and in case of failure of the later, an infusion of tobacco 2 ounces (60.) to the pint (480.). Vaginal injections of hot water and tampons or cocoa-butter suppositories medicated with opium, belladonna, or carbolic acid, are also available. Mercuric chloride lotions (gr. $\frac{1}{4}$ j to $\frac{3}{4}$ j [0.016–0.06 to 30.]) are recommended by many writers.

Iodoform, oleate and muriate of cocaine, the latter in from 2 to 4 per cent. solutions; 1 ounce (30.) of the fluid extract of coca, to 2 or 4 (60.–120.) of water; and linseed oil (especially for pruritus ani), are also recommended.

Jullien recommends in pruritus of the vulva:

℞	Zinc. oxid.,	3vj;	24	
	Acid. salicylic.,	gr. xv;	1	
	Glycerin.,	3vj;	24	M.
Sig.	Apply as required.			

Chéron, in pruritus of the vulva attending the menopause, has successfully used:

℞	Veratriæ,	gr. iiij;	20	
	Axung.,	3j;	30	M.

He also administers in pill-form $\frac{1}{120}$ grain of veratria rubbed up with licorice. Another useful formula is:

℞	Acid. tannic.,	℥j;	1 33	
	Spts. vin. rectific.,	āā 3ss;	āā 15	
	Glycerin.,			
	Aq. dest.,	ad f 3iv;	ad 120	M.
Sig.	Apply morning and evening on a rag.			

¹ Brit. Med. Jour., 1881, i., p. 327.

On account of the peculiar predispositions of the sex, anodyne preparations are attended with danger as regards the future habits of the patients and should be used with caution.

The surgical treatment of pruritus vulvæ may involve complete ablation of the external genitalia.¹ Sir Charles Ball² produces anæsthesia of the peri-anal region by dissecting away the skin in an oval about the anus and replacing the flaps after the dissection.

Prairie Itch.—This is a popular term applied largely in the Western, Northwestern, and Southern States of America to a cutaneous affection productive of itching sensations. It is supposed to be the disorder popularly described also as the "*Texas Mange*," "*Ohio Scratches*," "*Swamp Itch*," "*Lumberman's Itch*," etc. A parasitic origin has been claimed for it by several observers who also insist upon its contagious character and its curability by parasitocides.

Personal experience has led to the conviction that these terms are loosely applied to a group of cutaneous symptoms of diverse origin. The most frequent by far is a pruritus, of the kind described above as pruritus hiemalis, occurring in the autumn, winter, or spring of the year, and aggravated by the coarse and cheaply dyed woollen under-garments of the poor and hard-working inhabitants of lumber-camps, mining-districts, etc. With these causes in full operation, there is often aggravation after swallowing drugs for relief of the pruritus, based upon the idea of "purifying the blood."

With these pruritic cases occur those of undoubted scabies, for the study of which the reader is referred to the chapter devoted to that subject. The proportion between the purely pruritic and parasitic cases of this class cannot definitely be determined. It probably varies in different places and seasons, the proportion of cases of scabies increasing in the lumber-camps when they are reinforced by newly arrived immigrants infested with acari. It decreases to probably not more than from 1 to 2 per cent. of all skin-diseases in the interior villages and towns of the West and Northwest where there has been no immigration for some length of time, and where, after the first onset of sharply cold weather in the autumn, a large part of the inhabitants suffer from pruritic sensations in various degrees.

A review of the somewhat scanty literature of this subject³ suggests the conclusion that the disorder popularly designated as "prairie itch," etc., is far more rare in Europe than in America. It is possible that the situation of those parts of the United States where this group of skin-affections seems to prevail (at a great distance from proximity to the seashore, and still further separated from the Gulf-

¹ Cf. Ill. Med. Journ., 1905, p. 45. (Howard Kelly's and Borke's method.)

² Brit. Med. Jour., 1905, Jan. 21, p. 13.

³ See two papers by the author, entitled "On the Affections of the Skin Induced by Temperature-variations in Cold Weather," Chicago Med. Jour. and Exam., 1885, lii., p. 187, and 1886, liii., p. 116. Obersteiner: Wien. med. Wchnschrft., 1884, No. 16. Brodie: Peninsular Jour. Med., 1853-54, i., p. 506. Jones: Kansas City Med. Index, 1886, with views of several Western physicians. Clark: Med. Age, 1886. Payne: Brit. Med. Jour., 1887, i., p. 985. Corlett, J. C. D., 1894, xii., p. 457, and J. A. M. A., 1902, xxxix., p. 1583.

stream) may play an important part in the extraordinary sensitiveness of the skin to climatic changes. Certain it is that a great number of these affections are entirely relieved by removal to a suitable climate, more particularly to one of the Eastern, Southern, or extreme Western States.

Treatment.—The therapy of this affection is that of pruritus, already described, save where a parasite is recognized as the efficient cause, as in cases of scabies.

Prognosis.—The prognosis is favorable, though the disease is at times intractable, persisting or recurring with repeated thermometric variations until the warm season is at hand.

CLASS VIII.

PARASITIC AFFECTIONS.

The disorders due to invasion of the skin by parasites possess many features in common with those already described. In them, as in others, are observed the hyperæmic and exudative processes which result in surface-lesions of similar type and career. They differ, however, from other affections of the integument in that they are all induced by parasites of either vegetable or animal origin; and are, as a consequence, commonly characterized by certain special features. They involve the skin and its appendages, their symptoms being at times displayed chiefly in the integument proper, and at other times in one or more of the cutaneous appendages, according to the mode of propagation and attack, peculiar in each case to the parasite present. They are all in different degrees contagious; and, being induced by local and tangible causes, are usually relieved by external treatment. Their importance in cutaneous medicine rests not only upon the facts named above, but also upon the too general misconception regarding their nature, since there are many patients treated by internal remedies ingested vainly for long periods of time, who suffer from parasitic disorders often remediable by very simple local measures.

It should not be forgotten, however, that, distinct though these maladies be in an etiological sense, they are yet often practically commingled with others. Thus, an eczematous scalp in a child may by accident become the habitat of lice; and the eczema induced originally by the *acarus scabiei* may persist long after destruction of the parasite.

The term *tinea*, derived from a Latin word meaning "a moth or worm," has by common consent been adopted as a generic designation of the cutaneous disorders induced by the presence of vegetable organisms.

DISORDERS DUE TO VEGETABLE PARASITES. TINEA FAVOSA.¹

(Lat., *favus*, a honeycomb.)

(HONEYCOMB RINGWORM, PORRIGO FAVOSA, FAVUS. *Fr.*, TEIGNE FAVEUSE; *Ger.*, ERBGRIND.)

Symptoms.—Favus affects chiefly the scalp, but it also occurs upon the glabrous portions of the skin and upon the nails. In the

¹ For bibliography, see Bodin, *La Pratique Dermatologique*, ii., p. 617.

former situation it is usually first recognized by the development of minute, subepidermic, yellowish or reddish puncta, visible through the translucent stratum corneum at the site of implantation of the hairs. A circle of delicate vesicles may surround these spots. Puncture with a needle usually gives exit to puriform matter. In the course of a fortnight or more these lesions cover themselves with pin-head- to pea-sized and somewhat larger, friable, circular, and elevated crusts, having the yellowish tinge of the lemon or of sulphur, and a concavo-convex shape, with the free concave face of the disk exposed.

FIG. 151.




Copyright 1900 by G. H. Fox.

Favus capitis. (From G. H. Fox's Atlas of Skin Diseases.)

At the centre of the umbilication thus presented to the eye one or several hairs usually make exit to the surface. The inferior surface of this disk, or scutulum, rests upon the scalp, which is either moist and deprived over a circumscribed area of its epidermis, or is smooth, dry, reddened, and tender. When the crust is removed by traction upon the hairs or otherwise a minute cup-shaped depression is left at the point where the lowest level of the favus crust was in intimate connection with the epidermis.

PLATE XLV



Copyright, 1900, G. H. Fox. 

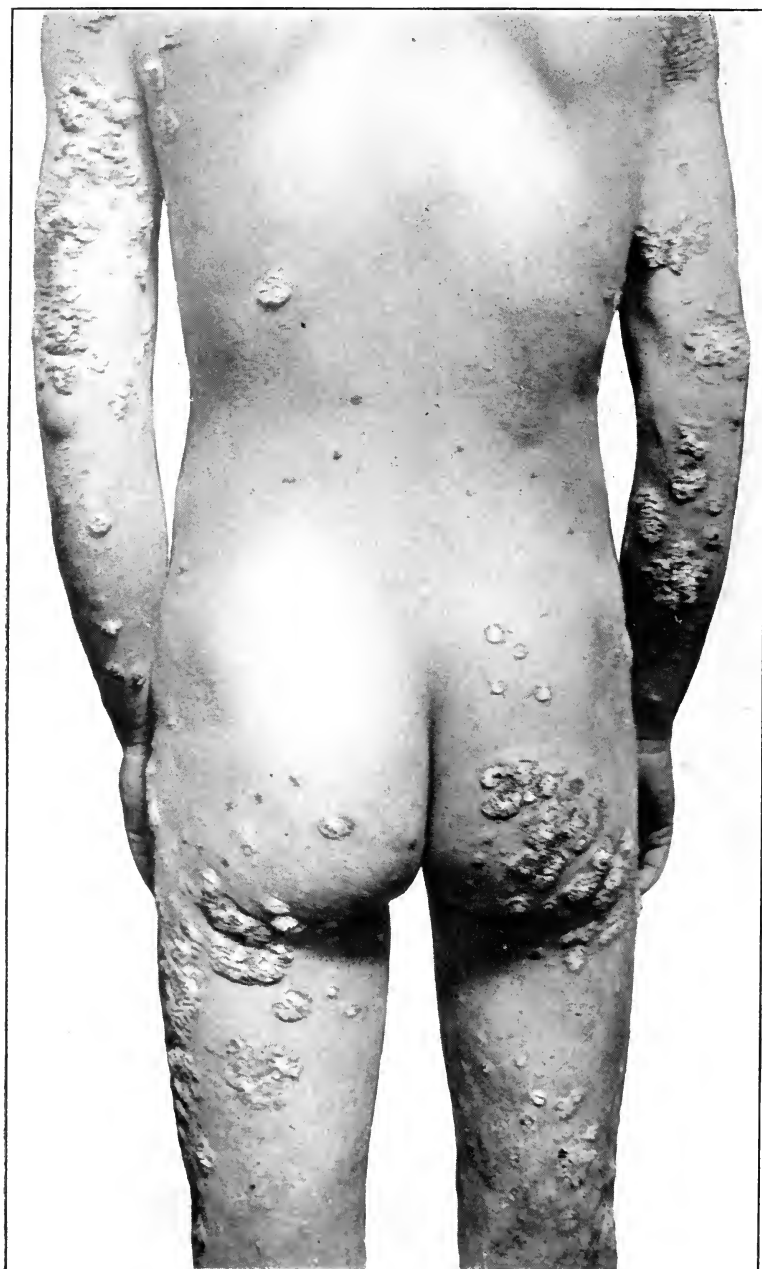
From G. H. Fox's Atlas of Skin Diseases.

Favus Corporis.





PLATE XLVI



Favus Corporis. (James Dunn.)

Generalized distribution.

The subsequent features of the crusts, the hairs, and the scalp are subject to variation. The crusts may acquire a brownish or a greenish tinge by admixture with dirt or with dried pus; may coalesce or may, by gradual desiccation, exchange the yellowish hue for the dirty-whitish shade of old mortar, a substance which they then resemble in dryness and friability (*Favus squamosus*). The hairs invaded both in the sheath and shaft may lose their lustre; become fragile; appear as fractured relics of longer filaments; readily be extracted from their follicles; and finally be shed, leaving hair-sacs destined to atrophy and incapable of reproducing a pilary growth. The scalp may first be the seat of an extensive hyperæmia or exudation going on to the formation of pus, when the fungus is a source of acute irritation in consequence of its active development. Later, when its destructive work may be said to have been accomplished, the scalp-surface is bald, irregularly atrophied, or disfigured with cicatrices, which at first are of a deep-red color, but which gradually fade, while here and there remain tufts of hair that have survived the attack.

The lesions may be discrete or be confluent, and may vary in either case. Occasionally but a few small and ill-developed crusts form upon the surface. The entire scalp is not often covered with a confluent favus-crust. The disease is usually chronic in its course. Untreated, it may undergo spontaneous involution after total destruction of all hairs and production of general follicular atrophy, but this is rare. It may last for fifteen or twenty years, and even longer. It is often accompanied by adenopathy.

The disease usually awakens a noteworthy degree of itching, and, as a result, it is not rare to find the favus-crusts torn and broken by the comb or the nails.

The yellowish disks of the disease occur also in typical development, though more rarely, upon the surface of the face (including the bearded cheeks, lips, and chin), and upon the trunk and extremities. Fox, of New York, has photographed a patient's knee which was covered on its extensor aspect with favus-crusts.

When the nails are invaded, light or deep-yellowish, circumscribed spots become visible through the nail structure, and by extension of these, in consequence of the growth of the parasite, the nail-tissue may be thickened, irregularly split, laminated, separated from its matrix, or atrophied. The complication is rare, and is supposed to be due to transfer of the parasite from the scalp to the hands in the act of scratching. When it exists the epidermis fringing the nail is usually also involved.

Upon the so-called "non-hairy" portions of the body favus occurs in the same forms as elsewhere, the localities in the order of frequency being those most exposed to the hands charged with the parasite, or to other sources of the disease, viz., the hands (chiefly the backs and nails), the upper and lower extremities, and the shoulders. It is a striking fact that favus may exist for years on the scalp with-

out spreading. At a single clinic we have exhibited five patients affected with favus, all scalp-cases, the eldest, a male, twenty-five years of age, who had suffered from the disease for twenty years without occurrence of the lesions elsewhere.

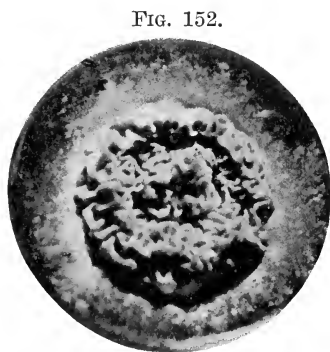
In favus of the body-surface, outside the scalp, there is often a resemblance to ringworm in the production of circular patches with an active border made up of vesicles or of papules, which may have a favus scutulum as a centre; or several of these cups may irregularly be spread over circles of scaling patches. In these cases there is often an acuity of symptoms not observed in scalp-cases and coincident gastro-intestinal signs of irritation, vomiting, etc., which Kundrat believes may originate in favus of the mucous surfaces of the oesophagus and gastro-intestinal tract.

The odor of fully developed favus is so characteristic that by it alone a diagnosis has been established. It is usually compared to the odor of mice; also to that of the urine of cats. It should not be confounded with the peculiarly disgusting odor of neglected scalps affected with lice or covered with pustules and filth. The disease not infrequently coexists with other cutaneous, parasitic, and non-parasitic diseases, as, for example, seborrhœa, eczema, and tinea tonsurans.

Favus of the Nail (*Favic Onychomycosis*).—(See chapter devoted to Disease of the Nail.)

Etiology.—Favus is practically always produced by the presence and development of the vegetable organism which is named after its discoverer, the *achorion Schönleini* (Fig. 153).¹ The disease is contagious simply because the parasite which produces it is capable of transmission from man to man, as also from animals to man, and *vice versâ*. It is often conveyed to man from mice, cats, dogs, rabbits, fowls, and ponies; but when derived from the lower animals is most

often transmitted from mice to cats and from cats to man. It shares with other diseases originating from vegetable parasites the peculiarity of attacking certain individuals specially predisposed to such invasion, either by reason of physical peculiarities of organization or because of accidental and fortuitous circumstances. It is most common from infancy to the thirtieth year of life. It is less common in the United States, Austria, and England than in France, Scotland, and Poland. It is said by Bergeron² to be a disease of the country, while tinea trichophytina prevails in the



Culture of Achorion of Schoenlein.
(MEWBORN.)

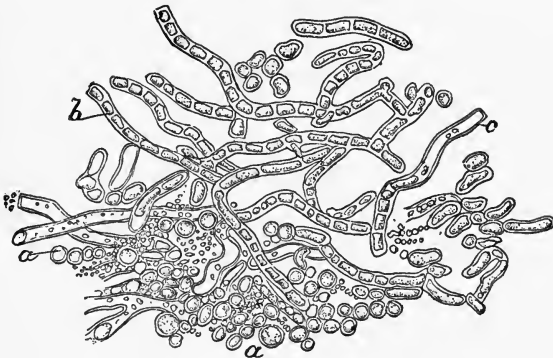
cities. This statement is corroborated by general experience. Favus

¹ Sabouraud, Brit. Med. Jour., 1908, Oct. 10, pp. 1089, 1094. The author describes here three species of favus fungi, and states that 99 per cent. of all cases are due to the variety known as the *achorion Schönleini*.

² Etude sur la Géographie et la Prophylaxie des Teignes, Paris, 1865.

is more common in public than in private practice, and the larger number of clinical patients with favus come to the city from the country.

FIG. 153.



Achlorion Schönleinii: a, spores; b, c, sporophores. (After CORNIL and RANVIER.)

Evidences of contagion are exhibited in those cases in which several members of the same household are affected with the disease; but in other cases the absence of a history of contagion after exposure indicates the relative difficulty experienced in propagating the contagious element in the case of favus. Thus, one individual exposed among a dozen who are diseased will fail to exhibit favus-crusts; and the latter by no means form in all situations of the same body where the fungus can be discovered by the microscope. Aubert,¹ indeed, presents an argument in favor of the production of the disease by traumatism, the resulting wounds, excoriations, etc., becoming by accident the seat of the disease. It is not very rarely discovered under poultices and fomentations.

Occasionally favus occurs in special localities with such development among men and the inferior animals as to constitute an epidemic. Girard² reports thus the simultaneous existence of the disease among sixteen cows and four children in the village of Nantoin, in France. It is propagated also upon the skin of rats and mice, from which it is transmitted to man, often through the medium of the domesticated cat and dog.

Pathology.—Under the microscope the fungus is readily recognized in the root-sheaths, the bulbs, and the shafts of the hairy filaments near the scalp. At a distance of about two inches from the bulb the parasite ceases to appear in the tissue of the hair. It is also seen upon the free surface of the skin. The favus-crust, softened by the addition of a 10 per cent. solution of potassium hydroxide, may be placed upon a glass slide over which a cover slip is placed and after allowing it to clear for 5 minutes it may be studied without other preparation. The hairs may be examined in the same manner

¹ "Rôle de Traumatism dans l'Étiologie de la Teigne faveuse," *Annales*, 1881, s. ii., ii., p. 289.

² *Lyon méd.*, 1880, xxxv., p. 547.

or they may be stained by the methods given for staining the ring-worm fungi. Under a good one-fourth- or one-sixth-inch objective the vegetation is seen to be composed of intricate masses of mycelium and spores in great quantity.

Quinke¹ attempted to distinguish between three varieties of the favus fungus, designated respectively as α , β , and γ . Elsberg, Kral, Pick, Unna, and others have, however, arrived at different conclusions upon the same subject, some recognizing but two of Quinke's forms; others, two separate forms not corresponding with the α , β , or γ form of Quinke; and still others, corresponding with none of those previously described. The majority of observers agree that there is but one achorion fungus, displaying itself in several forms both under the microscope and clinically, all differences being due to accidental influences (varying amount of heat, moisture, and friction in the involved surface).

The threads of the fungus usually preponderate, and appear as narrow, flattened, ramifying, short or elongated, linear cells or tubes, which may be simple and empty, or be divided more or less regularly by transverse partition-walls, transforming the longer and simple into shorter and compound cells. The latter often contain in their cavities sporules clinging to either side, in which case the mycelial threads are termed sporophores. These sporules are the vegetative part of the cryptogamous fungus, and develop by multiple subdivision into cells, which may also themselves similarly increase in number, or by the production, at the terminal extremities of certain mycelial threads, of spores or conidia. The conidia are encapsulated or are strung like beads upon a necklace, and they appear as round, oval-shaped, angular; or very irregularly contoured bodies, often provided with partition-walls like mycelium constituting thus compound cells. At the same time an amorphous granular matter can usually be distinguished in the mass of the fungus. The hyphæ vary in width from 0.0023 to 0.0030 mm.; and the spores from 0.0023 to 0.0052 mm.

Examination of the invaded scalp reveals, according to Unna,² the presence of the fungus at the lower border of the upper three-fourths of the root-sheaths, where chains of conidia appear among the histological elements. His view is that the cuticle of the hair offers a relative resistance to the growth of the vegetation; that the latter first penetrates the stratum corneum and the follicular orifice, and then stretches, upon the one hand, into the cortex and medulla through the cuticle of the hair; and, on the other hand, passes to the inner root-sheaths, the outer remaining always intact. In the epidermis the fungus is found chiefly between the superficial and deep portions of the stratum corneum. The superior pars vascularis of the corium exhibits enlarged vessels surrounded by inflammatory elements.

When the nail is involved the parasite may be recognized in the

¹ Monatshefte, 1889, viii., p. 49.

² Vierteljahr., vii., p. 170.

débris produced by scraping the nail-substance; often also in the epidermis bordering the nail. The fungus exhibits here the same microscopical features as upon the scalp, though in consequence of the denser structure of the nail-substance its vegetation is usually less luxuriant.

Diagnosis.—The clinical recognition of favus is based upon the presence of the characteristic, yellowish, cup-shaped crusts, which in all typical cases are isolated, each pierced by a pilary filament and each situated in a well-marked depression of the surface of the scalp. In the disseminated form the disks of conglomerated scutella with defined and frequently festooned edges, friable, yellowish or yellowish white in color, and greatly differing as to their bulk and contour, are commonly suggestive of the nature of the disorder. In yet other irregularly formed crusts the affected area seems to be covered with a plaster-like mass irregularly distributed and of uneven thickness over an enormous patch of disease which may be practically coextensive with the entire scalp-surface. Incidentally there may be a history of contagion and a peculiar odor emanating from the scalp. The secondary effects upon the hairs, hair-follicles, and skin are also, when present, significant. In cases of long duration the atrophy, scar formation, and permanent baldness are characteristic. White, of Boston, in an essay on the "Vegetable Parasites, and Diseases caused by their Growth upon Man," calls attention to the stage in which the disease is likely to be mistaken for ringworm. It exists before the formation of the crust, and may be characterized by hyperæmia, vesiculation, or papulation, often unnoticed beneath the hairs of the scalp. In doubtful cases the microscope will usually establish the diagnosis, though Bodin, Morris, Sabouraud, and other observers think it is not always possible to draw a sharp line between favus and ringworm, and that cases occur in which it is impossible—with the means now at our disposal—to make a differential diagnosis with precision.¹

Aubert,² in the absence of the clinical features named above, lays stress upon an intense redness of the scalp where the hairs have been cut and the crusts removed, this color being limited to the portions attacked by the disease. The hairs also, as a result of disintegration of their elements are infiltrated with air, and look opaque and black by transmitted light; by reflected light they appear polished and stratified, as if constituted of layers of tissue. It should not be forgotten that in exceptional cases favus-crusts coexist upon the body with other diseases of prior or of subsequent origin, as indicated. The disease should not be confounded with seborrhœa, pustular eczema, or psoriasis of the scalp, none of which exhibits the special features of a parasitic fungus:

Treatment.—The first indication in the treatment of favus is to

¹ For literature of this subject, see Mewborn, J. C. D., 1903, xxi., p. 11 (illustrations and bibliography), and the references tabulated with the introductory paragraphs on Ringworm.

² *Annales*, 1881, s. ii, ii., p. 34.

cleanse the affected surface from all crusts and scales that may be present. For this purpose the scalp (if this be, for example, the affected part) is first shorn of its hair with scissors, and is then thoroughly soaked with olive-, cod-liver, or other oil, or with glycerin. After this treatment all the crusts are scraped away with a spatula, and the scalp is washed clean with hot water and soap, spirit of green soap being here preferably used. The scalp should then again be anointed with oil or be covered with an emollient poultice. Once thoroughly cleansed by repeated soakings with oil and by ablutions, it is necessary to resort either to the topical employment of parasitocides (agents capable of destroying the fungus) or to epilation (extraction of the hairs). Often both measures are required. Without further treatment the scalp, however completely freed from all evidences of the disease, will not fail to show fresh favus-crusts in a fortnight or somewhat longer time.

Epilation is practiced with the aid of epilating-forceps. These forceps should be constructed with an easy spring that will not tire the fingers of the operator; with blades that are sufficiently broad to grasp a few hairs at once; and with smooth or but slightly serrated faces of the blades, as otherwise the hair is liable to fracture in the grasp of the instrument. The surface to be operated upon should previously be anointed with vaselin or with olive-oil, and the hairs entirely be removed, a sufficient number, covering a definite space, upon successive days.

The tediousness of this process has led to several devices by which it is sought to do away with its necessity. Originally the "calotte" was employed for the removal of the hairs; it was made by smearing a disk of leather with pitch, and applying it over the scalp. When the calotte was subsequently removed by a brisk twitch with the hand the hairs which adhered were forcibly uprooted *en masse*; those remaining being adherent in their sacs in consequence of the fact that they had not been invaded by the fungus. As a substitute for this procedure, Bulkley¹ employed adhesive masses or sticks, which can be melted and made to adhere at once to large numbers of the hairs. When cold they can be withdrawn from the surface with the hairs attached. These sticks are from two to three inches in length, and from one-fourth to three-fourths of an inch in diameter. The hair is first clipped so as to be about one-eighth of an inch in length. The end of the stick is then heated in an alcoholic flame, and quickly placed upon the scalp. It is thus left in place until cold, and is removed by bending it over and drawing upon the hairs successively with slight rotation. When free it is found thickly set with the extracted filaments, which may be burned off in the alcohol flame, thus destroying both the hairs and any adherent fungous masses. The stick is then carefully wiped clean with paper, after which it is again ready for use. The formula for the mass of which these sticks are composed is as follows:

¹ "Favus and its Treatment by a New Method of Depilation," Arch. of Derm., 1881, vii., p. 1496.

R	Ceræ flavæ,	5iij;	12	
	Lacæ in tubulis,	5iv;	16	
	Resinæ,	5vj;	24	
	Picis Burgundicæ,	5xj;	44	
	Gummi dammar.,	5jss;	45	M.

Inasmuch as the disease is so frequently intractable and resistant to the usual methods of treatment and its tendency is to permanently destroy the hair and produce atrophy of the scalp, radiotherapy is advised above other methods of treatment. Complete epilation may be produced by this method with safety and with return of the hair thus removed, and with the majority of the cases complete eradication of the disease.

The parasitides in greatest favor are: corrosive sublimate in solution in the strength of from 1 to 4 grains (0.066–0.266) to the ounce (30.); formalin (1 to 4 per cent.); sodium hyposulphite in saturated solution; pure or diluted sulphurous acid; spirit of green soap; chrysarobin, pyrogallol, tar, croton-oil; boric, carbolic, and salicylic acids; petroleum, chloroform, ether, creosote, and oil of cloves. The addition of acetic acid to liquid applications, or washing the surface with vinegar immediately before applying the parasiticide, favors penetration of the remedy. Ointments are also useful containing mercury (citrine ointment, yellow sulphate, or white precipitate), naphthol, benzol, thymol, sulphur, pyrogallol, salicylic and carbolic acids. Chrysarobin is effective in an ointment, though objectionable on account of the staining of the scalp, and, almost inevitably, of the face also. Lenzberg¹ generates sulphur-fumes in a dish of red-hot coals attached to a frame (made of wood or of pasteboard) close to the head of the patient. By means of a paper cap the fumes are collected and retained (from five to ten minutes) in contact with the patient's hair. During ten years' trial of this plan he has never been compelled to resort to epilation.

One or more of the methods may be needed, either at the same time or by repetition or alternation, until the fungus is entirely destroyed, the requisite period usually extending over three months. Treatment should then be discontinued in order to test the result by observation. If, in the course of a fortnight or more, a relapse occurs, treatment is to be promptly renewed. Upon the non-hairy portions of the body parasitides thoroughly applied usually insure radical relief. When the nail is involved, it should be cut short and carefully scraped or be softened by repeated applications of a strongly alkaline lotion, after which a parasiticide may be employed in ointment or lotion.

In general, it may be remarked that patients long affected with rebellious favus may need a roborant course of treatment and nutritious diet. Cleanliness here, as in all the parasitic disorders, is important. As adjuvants in the treatment of the scalp and nails it is well to remember that continuous applications of a parasiticide are

¹ Der prakt. Arzt., February, 1881.

aided by caps or cots of impermeable material superimposed upon rags saturated with the medicament employed. For use in this manner, and especially for the nails, Sabouraud recommends a solution containing 1 gramme of iodine and 2 grammes of potassium iodide in a litre of distilled water.¹

Prognosis.—The prognosis is generally favorable to the ultimate termination of the disease in all cases; for even the most rebellious and untreated forms are relieved when the hair-follicles atrophy. Upon the non-hairy portions of the body the disorder is rarely severe if promptly and efficiently treated. Upon the scalp the prognosis is proportioned to the extent, severity, and period of prior invasion of the disease. Early and vigorous treatment of the scalp in healthy children is usually followed by satisfactory results. In long-neglected subjects of the disorder the result may be a remediless and characteristic baldness, the affected surface being provided with scanty wisps of stunted and uncolored hairs. Neglect, filth, and systemic malnutrition are the most unfavorable elements in any case.

TINEA TRICHOPHYTINA.

(Gr., *θρίξ*, hair; *φυτόν*, a vegetation.)

(RINGWORM.)

Ringworm is a disease of the hairs and hair-follicles of the scalp and the beard, as also of the non-hairy portions of the body. In each case it is produced by the presence of a vegetable fungus. Until recently all forms of ringworm, both of the hairy and non-hairy portions of the body, were supposed to be produced by a single fungus, the trichophyton. In 1891 Furthmann and Neebe first advanced the idea that there were two or more fungi responsible for the various manifestations of the disease. Within the last few years a number of investigators, headed by Sabouraud, in a series of researches, have more definitely settled the etiological value of these fungi.² There are at least two distinct and unrelated forms capable of producing the appearances classed as ringworm: the *Microsporon Audouini*, or small-spored fungus, and the *Trichophyton*, or large-spored fungus.

¹ See paragraphs at the close of the chapter on Ringworm.

² Sabouraud, *Les Trichophyties humaines*, with Atlas, Paris, 1894; *Diagnostic et traitement de la pelade et des teignes de l'enfant*, Paris, 1905; *La Pratique Dermatologique*, iv., p. 467; Adamson, B. J. D., 1895, vii., pp. 201, 238 and 373; Morris, *Practitioner*, Aug., 1895; Ringworm and the Trichophyton, London, 1896; Fox and Blaxall, B. J. D., 1896, viii., pp. 241, 291 and 337, and *Brit. Med. Jour.*, 1899, ii., p. 1529; Transactions of Third International Congress of Dermatology, London, Aug. 4 to 8, 1896, including papers by Sabouraud, Rosenbach, and Morris; Rosenbach, "Ueber die tieferen eiternden Schimmelerkrankungen der Haut," Wiesbaden, 1894; Leslie Roberts, *Brit. Therap. Jour.*, Sept. 29, 1894, and *Jour. Path. and Bact.*, Aug., 1895. (This observer classifies the fungi according to their ability to digest horny tissues.) M. Fadyen, *Jour. Path. and Bact.*, April, 1895; Jamieson, *Brit. Med. Jour.*, Aug. 20, 1893; Bodin, *Des Teignes tondantes du cheval et leur inoculations humaines*, Paris, 1896; Mibelli, *Annales*, 1895, s. iii., vi., p. 733; Charles J. White, J. C. D., 1899, xvii., p. 1; Ceresole, *Annales*, 1906, s. iv., vii., p. 743.

Of the latter, several varieties are recognized. The microsporon appears under the microscope chiefly in the form of a large number of round spores, irregularly grouped or massed about the follicular portion of the hair. Mycelial threads, large and branching, are also seen, chiefly within the hair. The sheath of spores surrounding the hair is often continued upward about the latter for one-sixteenth or one eighth of an inch above its exit from the follicle, and in this situation can be recognized by the unaided eye as a whitish or grayish coating of the hair.

The mycelial threads of the microsporon are all within the hair proper, and after repeatedly dividing and subdividing they terminate on the outer surface of the shaft in fine filaments, at the extremities of which are the spores, which in this fungus are external. In France the microsporon is responsible for about 60 per cent. of all cases of ringworm of the scalp in children. The fungus is not found in ringworm of the beard or of the body except in the form of small irregularly outlined, slightly reddened, and furfuraceous patches, occurring on the face and neck in children having ringworm of the scalp; occasionally on the skin of adults who come in contact with such children. Such lesions of the skin do not at all resemble ordinary ringworm, as their outlines are irregular and ill defined, and they rarely persist for more than a few days at a time. In France the microsporon is rarely if ever found in kerion.

The trichophyton is composed of spores which vary greatly in size, but which, as a rule, are considerably larger than those of the microsporon. They are frequently cuboidal, oval, or irregularly rounded; but their chief characteristic lies in their arrangement in lines or chains extending up and down the hair-shaft. The mycelium is found without but never within the hairs. The trichophyton occurs in three varieties: the endothrix, in which the spores occur wholly within; the ectothrix, in which the spores are distributed wholly without; and the endo-ectothrix, in which the spores are partly within and partly without the hair. The endothrix, like the microsporon, is found chiefly in ringworm of the scalp of children, though it also may produce transient, inconspicuous, irregular, furfuraceous, and slightly reddened patches on the face and neck of children affected with this form of ringworm. On the scalp the endothrix produces lesions which are often distinctly different from those caused by the microsporon. These differences are noted in the clinical description of *tinea tonsurans*. The ectothrix and the endo-ectothrix apparently are derived either directly or indirectly from the domestic animals, and are responsible for ringworm of the body, of the beard, and of all suppurating forms of the disease.¹ By means of culture-experiments a number of subvarieties of the trichophyton are differentiated, many of which, however, are not generally accepted. These varied appearances are looked upon by some as the result largely or wholly of dif-

¹ Bodin reports four cases of superficial sycosis due to endothrix alone (*Annales*, 1900, s. iv., i., p. 1205).

ferences in the media and circumstances of cultivation. It is well known that slight modifications of the culture-media produce marked changes in the character of a fungus-growth. Under certain conditions the trichophytions may assume forms indistinguishable under the microscope from those of *tinea favosa*.¹

In London, Morris, Fox, Adamson, and others find that the microsporon is responsible for more than 90 per cent. of all cases of ringworm of the scalp in children, and that it also occurs in some cases of ringworm of the body, and even in some of the suppurating forms of the disease, as kerion. The trichophyton is comparatively rare in London. On the other hand, Mibelli states that the microsporon is almost unknown in some parts of Italy, and it would seem to be equally rare in some portions of Germany. In Boston Dr. Charles J. White found the microsporon in 88 per cent. of scalp cases; Corlett² in 90 per cent. of such cases in Cleveland; and G. A. Wende³ in 89 out of 90 cases in Buffalo. In Scotland Walker⁴ found it in 18 out of 20 of Jamieson's cases. A similar preponderance of the microsporon in ringworm of the scalp in children has been our experience in Chicago. The different varieties of these fungi seem to have a definite geographical distribution.

To prepare a hair for examination, it may be placed between a slide and cover-glass in a solution of potassium hydroxide. Sabouraud uses a 25 to 40 per cent. solution, which is admirable for rapid work, but which quickly disintegrates the hair. Adamson employs a 5 or 10 per cent. solution, which clears the hair slowly in the course of one or several hours. By making frequent examinations of the specimen the observer can arrest the destructive action of the solution at any stage desired, and thus better preserve the relative position of the fungus to the hair. Many attempts have been made to stain the fungi, which unfortunately show an affinity for the same stains as does the cortical layer of the hair. A satisfactory method has been devised by Morris and his laboratory assistant, Calhoun. It is a modification of the Gram and Weigert stain for bacilli, and gives good results. The hair is first washed with ether to remove fatty debris; it is then put for one or two minutes in the Gram iodine solution, and after drying is stained for from one to five minutes in gentian-violet and anilin-water. It is again dried and treated for a minute or two with the iodine solution, and for an equal length of time in anilin-oil containing pure iodine, after which it is cleared with anilin-oil, washed in xylol, and mounted in Canada balsam. Coarse, dark hairs and spores within the hairs require more time for staining than do fine, light-colored hairs and the fungus-elements situated without the hair.

While microscopical examination will often suffice to distinguish the microsporon from the trichophyton, or even for recognition of some of the varieties of the latter, the finer—and often disputed—

¹ Cf. Mewborn, J. C. D., 1903, xxi., p. 11 (bibliography).

² Corlett, J. A. M. A., March 18, 1899.

³ Wende, G. A., *ibid.*

⁴ Walker Norman, *An Introduction to Dermatology*, 1899, p. 150.

points of difference can be appreciated only by means of culture-experiments, the details of which require fuller description than can here be given.

Recent studies of the ringworm fungus,¹ though interesting from an etiological standpoint, have added little knowledge of practical value in treatment of the disease, nor have they furnished a basis for a new scientific classification of the different forms of ringworm.

As the several regions of the body, when invaded by the parasite, display lesions which are more or less peculiar to itself, it is useful to consider each separately. Ringworm of the body is, therefore, designated *Tinea Circinata*; of the scalp, *Tinea Tonsurans*; of the beard, *Tinea Sycosis*.

Tinea Circinata.

(HERPES TONSURANS, RINGWORM OF THE BODY. *Ger.*, SCHEERENDE FLECHTE; *Fr.*, HERPÈS CIRCINÉ, TRICOPHYTIE.)

Symptoms.—Ringworm of the body displays different symptoms according to the temperature in which the vegetation flourishes and the various external irritants to which the skin where it has once been implanted is subjected.

The macular form of the disease is characterized by the occurrence of one or of several pea- to large coin-sized, circumscribed, reddish circles, usually paling under pressure, often at the general level of the integument, occasionally slightly raised above it, forming then a flattened disk. The centre of the circle may be paler, or indeed to the naked eye be unaffected, transforming the patch to an annular lesion, from which circumstance it originally received the name "ringworm." It develops within certain limits, rarely exceeding five or six inches in diameter, by peripheral extension; and is usually characterized at the outer border by slight, whitish, furfuraceous desquamation. This form of lesion is usually seen upon exposed surfaces of the body where there is less heat, moisture, and friction than upon other parts, as, for example, the forehead and neck in moderate atmospheric temperatures. From it may be developed the other forms described below. The disease may recur within the peripheral border; in this way occasionally two, three, or more concentric rings or parallel bands of crescentic outline may be visible in a single patch of disease. Frequently a tendency to a peculiar formation, often that of concentric circles, is found in every patch existing at the same time in a given case. It is possible that the various types are produced by different species of the fungus. The subjective sensations are a trifling degree of itching or of burning. Should these rings extend to the beard or the scalp, the circinate may coexist with the other varieties of the disease.

The vesicular lesions of ringworm appear as such at the onset, or

¹ Sabouraud, *Brit. Med. Jour.*, 1908, Oct. 8, pp. 1089, 1094. This article describes the bacteriology of the fungi and the author classifies the fungi according to cultural findings.

they rise from the macular lesions described above. In the former case pin-point-sized, transitory, and superficial vesicles or vesico-papules spring from a central point or focus, or speedily shrivel until they are represented merely by minute, whitish, branny scales. To these lesions others succeed, always at the periphery, and to these again yet others, the rosy or the reddened base on which they rest

FIG. 154.



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Trichophytosis corporis. (From Dr. G. H. Fox's Atlas of Skin Diseases.)

being sometimes slightly in advance toward the outlying skin. The enlarging circlets of disease proceed in their course to an evolution similar to that observed in the macular forms. The difference, due to a more active development of the fungus, is noted not merely in the type of the lesion, but also in the slightly exaggerated pruritic sensations that are awakened. Rarely, both of the forms described are presented; with acute symptoms and extensive development, in multiple patches spreading over the face, neck, trunk, and extremities, accompanied by a slight febrile movement and moderate tumefaction of the affected surfaces. As a rule, the eruption is trifling, and may, indeed, be limited to a single ring, or to a few circlets about the neck, terminating in the branny desquamation described; but in the severer forms the evolution of the disease may persist for months; and crusts form, the fall of which leaves annular pigmentations of temporary duration.

The papular and rare pustular forms of the disease observe the same peculiarities with respect to the clearing of the centre, the annular appearance of the advancing area of involvement, and the production finally of scales and crusts. They represent, however, either a much more luxuriant vegetation of the fungus, or the irritation of the affected part by friction and heat, or, what is probable, the coöperation of the two. They are, hence, most commonly observed upon the back, the belly, the intermammary and inframammary regions, and the inner faces of the thighs and arms, in which localities they occasionally occur with chronic manifestations. The papules are light- or dull-reddish, pinhead-sized and larger, solid elevations, roundish,

oval-shaped, irregular, or confluent, forming eventually bean- to coin-sized raised disks with a pale, exfoliating, or actively inflamed centre, the so-called *nummular erythema*, or *discoïd trichophytic erythema* of French authors. Some of the cases of *conglomerate* or *agminate folliculitis* are due to the trichophyton.¹ The itching in these forms is sometimes severe; and the process may display central recrudescence, as noted above. Pustules found at the periphery have the size and distribution of the other lesions described. They represent merely an aggravated exudative process awakened by the fungus and the scratching incident to the pruritic sensations excited.

Eczema Marginatum, Tinea Trichophytina Cruris.—Partly because of the controversy which the subject aroused, special attention was once directed to this variant of the disease which Hebra was first to describe. It is most marked upon those portions of the body which come in contact with the saddle when a rider is mounted on a horse—that is, the perineum and the inner faces of the thighs, the region marked by the reinforcing patch in the trousers of the cavalryman. The disease, as encountered here, occurs in both sexes. It is characterized by extensive exudation in bright or lurid patches, with a very distinctly defined, raised border, showing a sharp contrast with the healthy skin beyond, from which peculiarity it has its name. It may extend laterally over the groins, upward over the pubes, and backward over the sacrum, being generally defined at the periphery by a crescentic outline. The centre may be paler and less involved, or actively irritated, while the periphery still extends in one or more annular festoons down the inner side of the thigh or upward over the regions indicated. The itching is severe; the course of the disease is obstinate, persistent, and subject in a remarkable degree to relapse in the same locality. The fungus is always present, whether occurring as a cause or an epiphenomenon of the disorder. The disease was rightly named by Hebra, and it deserves special recognition under whatever title it may be classified. It is a true eczema, with special features, complicated by the development of the trichophyton, and, as is now well known, often by other representatives of the “dermatological flora.” It is aggravated by heat, the moisture of sweat, and the friction of apposed surfaces of the skin in contact with each other and the clothing. After detecting the fungus in scales scraped from the surfaces thus involved, one is always in such cases impressed with the characteristic clinical peculiarities of the disease. It is usually of symmetrical distribution, due to the circumstances of its development, and in this respect differs from the other manifestations of the disease. The condition may occur in milder or even severe forms in the axilla, or about the breasts of women, or about the umbilicus. In such cases it is indistinguishable clinically from a disorder described by Vidal under the title *circinate* and *marginate pityriasis* (*pityriasis circiné et marginé*), which he regards as due to *microsporon anomæon*, or *dispar*.

¹ Cf. Schamberg, J. C. D., 1902, xx., p. 410 (review of published cases).

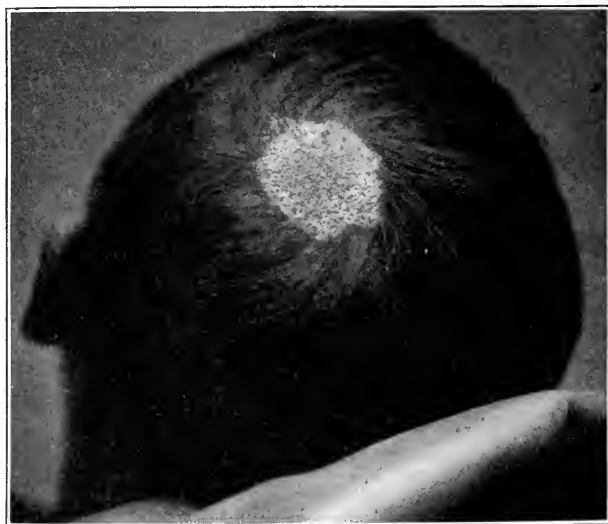
Tinea Tonsurans.

(RINGWORM OF THE SCALP, HERPES TONSURANS, TINEA TONDENS.
Ger., SCHEERENDE FLECHTE; *Fr.*, TEIGNE TONDANTE.)

Ringworm of the scalp is a disease chiefly of children, and occurs most frequently among those congregated in public institutions. The gregarious habits of children and the frequency and intimate character of contacts in their amusements and studies greatly increase the chances of contagion when one of their number is affected with ringworm of the scalp. As a consequence, the early recognition and relief of the disease furnish problems among the most imperious presented to the general practitioner as well as to the dermatologist. Important considerations relating to the segregation and education of children are related to the question of treatment. Nor should the physician, examining and giving advice about the scalp of a number of children, forget that his hands may transmit the disease to those as yet unaffected.

Symptoms.—The differences to be particularly noted between ringworm of the body and ringworm of the scalp depend largely upon the fact that in the latter the fungus makes its way to the hair-follicles and there finds the nutriment for its multiplication and development. The symptoms usually first observed are circumscribed, small coin-

FIG. 155.



Copyright 1900 by G. H. Fox.

Trichophytosis capitis. (From Dr. G. H. Fox's Atlas of Skin Diseases.)

sized, roundish patches upon the scalp, wholly or partly covered with minute, whitish, slate-colored, grayish, or dirty-yellowish scales. Sometimes the formation of the scales can be observed as they develop upon a hyperæmic and reddened area. Still more rarely, pin-point-

sized, transitory vesicles or pustules precede. The hairs upon such a patch seem irregularly clipped short near the surface or, as it is frequently styled, "nibbled" off, thus producing the effect of partial baldness in the involved area. Among them may often be found lustreless, dry, long, and fragile hairs, which break upon slight traction or flexion. The patches may increase in number and spread individually in area until, in the course of weeks or months, the entire scalp is invaded. In the older patches young and downy hairs may here and there be seen, pushing up the stumps left by those that have fallen. One or more of various phases of the disease may be presented in its subsequent evolution. Thus, a single patch may extend to the size of that of a large coin or of the palm, and the disease be throughout limited to that area. Again, as set forth above, almost the entire scalp may be covered with relatively small or enlarging patches, or, even without the occurrence of any distinct patch, isolated hairs or tufts of hairs here and there over the entire scalp may exhibit evidence of impairment. The hairs, instead of "starting" from the patch, may be twisted, imbricated, or matted, and be covered with grayish scales. The disease may be acute or be chronic in its course. Instead of assuming the dry and squamous type described, acute and exudative symptoms may develop, in which event the rare vesicular lesions are succeeded by the exudation of a gummy secretion and the formation of crusts. Lastly, there may be produced the variety known as "kerion," which is described below.

Pruritus, in various grades of severity, though usually mild, is induced by the disease; and often the patches are altered in appearance by the traumatism produced by the finger-nails and the comb. When the scalp is very generally invaded by the squamous form of the disorder its appearance is very similar to that noted in diffuse seborrhœa, chronic eczema, and psoriasis of the scalp, except that the hairs are less pasted to the surface; are more lustreless, friable, and contorted in shape; and much more often are represented by stubble or stumps. The disease may occur coincidently with ringworm of the body, and indeed at times there may be detected a ring, half of which on the neck presents the typical aspect of tinea circinata, and the other half involving the scalp exhibits the features here described.

Stowers,¹ Sangster,² as also Hutchinson, Tay, Hillier, Baker, and others, have recorded cases in which the disease coexisted with alopecia areata. Geber asserts that after exfoliation of patches of ringworm the scalp may, in cases, become absolutely bald, smooth, and glossy. This condition may exist from the beginning in the *Bald Tinea Tonsurans* of Liveing, which is often mistaken for alopecia areata, an error readily corrected by the recognition of scaling patches with hairs exhibiting under the microscope evidences of the existence of the fungus. It is to be remembered that in all such persistent scaling patches left after treated or untreated ringworm of the scalp the possibility of contagion is not averted.

¹ Lancet, 1881, i., p. 326.

² Ibid., 1880, i., p. 425.

The *Disseminated Ringworm* of Alder Smith affects isolated hairs or small groups of hairs scattered over the scalp, a broken stump, or a group, or a relatively small number, of lustreless, dry, and friable hairs furnishing the only evidence of the disease.

Ringworm produced by the microsporon Audouini can often be distinguished clinically from that produced by the trichophyton. In the former the patches are single or few in number, are rounded or oval in outline, may be of considerable size, are usually slightly reddened and furfuraceous, and are more or less covered with hairs which are lustreless, dirty looking, broken off at irregular distances from the surface, and easily epilated between the thumb and finger in considerable numbers. Moreover, in this form a grayish or whitish sheath (composed of spores) is seen encircling each hair and extending from one to three millimetres above its exit from the follicle. In patches of ringworm produced by the trichophyton the patches are much more numerous, but are very small and irregular in outline, and instead of being covered by hairs and broken stumps of hairs, usually show a number of black dots at the mouths of the follicles caused by the breaking of the hair at or beneath the surface of the skin. In this latter form of ringworm the scalp itself is usually normal or nearly so, scaling not being usual; and, instead of forming patches, the disease may affect isolated hairs or small groups of hairs. The disseminated ringworm and the bald tinea tonsurans mentioned above are probably produced by the trichophyton, and not by the small-spored fungus. It is undoubtedly true that the clinical differences mentioned above can be noted in some cases, and the diagnosis made at once from a simple inspection of the affected areas. In the majority of cases, however, the clinical features are not sharply marked, and the diagnosis must rest upon microscopical examination, or even upon culture-experiments.

Lastly, it is to be noted that in tinea tonsurans at times the efforts of nature are successful in securing spontaneous relief. With the defluvium capillitii and exfoliating epidermal plates the fungus may finally be removed; the resulting alopecia be followed by a growth of healthy pilary filaments; and, even though years be required for this long process, in the end no trace of the disease be discernible.

Tinea Kerion (*Kerion Celsi*, from *κηρίον*, a honey-comb).—The occurrence of active and usually circumscribed inflammation in a portion of the scalp affected with ringworm is at times followed by certain peculiar features. This complication of ringworm was recognized early in the history of medicine by Celsus, whose name has since been associated with its lesions. Tilbury Fox, in 1866, was first to recognize its identity with tinea tonsurans; and it has since been the subject of a number of papers by Tanturri, Maiocchi, Schilling, Barduzzi, Auspitz, and Wilson. In the United States, Atkinson¹ has made it the subject of a memoir.

The symptoms are the occurrence of acute inflammation, usually

¹ Arch. of Derm., 1881, vii., p. 47.

circumscribed, though occasionally diffuse,¹ in a portion of the scalp, where a tumor forms which may project to a considerable height above the general level. In time the appearance presented is suggestive of anthrax benigna, since from the tumid orifices of numerous distended follicles a viscid, semitransparent, puriform fluid exudes. The latter is characteristic. The hairs loosen and fall. When the view of the lesion is not obscured by the pilary growth it appears as a flattened hen's-egg- to turkey's-egg-sized, boggy, semiglobular tumor, its surface congested, reddened, glazed, and often exhibiting other evidences of inflammation, with split-pea-sized, pustule-like lesions distributed over its surface, or, when these have ruptured, exhibiting the gaping apertures described above, from which a gummy secretion is poured in varying quantities. Modification of this condition occurs, such as the production of a true subcutaneous abscess with fistulous sinuses. The sensations awakened are usually painful; the course of the disease is chronic. It may begin with the usual symptoms of ringworm of the head, though often there is no history of the latter. The complication is a rare one.

The parasite may and may not be found in patches of kerion, according to the acuity of the present or the precedent inflammatory process. If the latter be of high grade, and suppuration result, the fungus is destroyed, a result the attainment of which has been attempted in the production of "artificial kerion" by means of croton-oil for the relief of tinea tonsurans. In the earlier stages represented by deep-seated follicular inflammation, with pustulation of the hair-shafts, the latter may be seen microscopically to be invaded with spores.

TINEA CILIORUM.—Ringworm of the eyelashes is a rare condition. It may occur in connection with the disease in the beard or on the glabrous skin. In the recorded cases the lashes were broken off short and usually concealed by a scale. The lids were red and swollen.

Tinea Sycosis; Hyphogenous Sycosis.

(*TINEA BARBÆ, SYCOSIS PARASITICA, MENTAGRA PARASITICA, RINGWORM OF THE BEARD, "BARBERS' ITCH."* Ger., *PARASITÄRE BARTFINNE*; Fr., *TRICHOPHYTIE SYCOSIQUE*.)

Symptoms.—The disease is best studied at its onset in the beard of a blonde subject with relatively fine, downy hairs, where are presented the typical features of tinea circinata, ringworm of the body. One or several, reddish, pea- to small-coin-sized rings become visible, with pin-point-sized vesicles, branny scales, and often, indeed, no other lesion save a hyperæmic, scarcely elevated margin at the periphery. The hairs over the patch may be fragile, and clusters of pilary filaments here and there betray evidences of change. With proper treatment the disorder may not progress beyond this point.

¹ Wallis, J. C. D., 1905, xxiii., pp. 428, 431. Ten cases with multiple small kerion are described occurring in girls from eight to seventeen years of age.

In some cases the very slight degree of itching awakened by the process just described may be intensified, and large plaques form, a portion of which may extend from the region of the beard over the face and neck, or *vice versâ*. When fully developed a phlegmonous disorder is produced which bears some analogy to the kerion just described, and which may so actively progress that it is first seen in typical development. The skin is congested and reddened, with sub-epidermic (or débris of ruptured) pustules at the orifice of the pilary follicles, and it is studded irregularly with firm, pea- to nut-sized papules and tubercles. The tubercles are usually aggregated in masses or lumps which involve the skin and subcutaneous tissue, and they are firm, often tender and painful, rarely boggy and furuncular. When pierced they give exit to a characteristic, muciform, gluey, yellowish, and sticky fluid, puriform yet differing from pure pus, that rapidly dries into crusts. These composite lesions are usually circumscribed in a given area of involvement, very rarely covering the region of the beard in symmetrical disposition, more often limited to one cheek or to the cheek and chin.

FIG. 156.

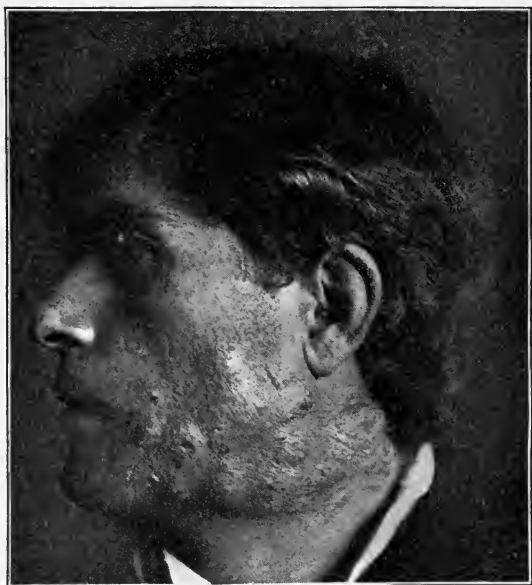


Tinea sycosis. (MEWBORN.)

The hairs in the invaded region are involved as in ringworm of the scalp. These filaments break near the surface of the integument, leaving ragged stumps; or they spontaneously fall after being loosened in their follicles. The ease with which they may be epilated is one

of the most characteristic features of the disease; they are slipped out of their follicles as readily as if they had been oiled; or, as Anderson writes, "as easily as a pin can be pulled out of a pin-cushion." They are then often whitish because enveloped in the fungus producing the disease. In either event the resulting gradual thinning or removal of the hairs renders the disease of the surface more con-

FIG. 157.



Tinea sycosis.

spicuous and deforming. At the edge of a patch thus exposed, deformed, lustreless, contorted, flattened, twisted, or split hairs may be found. Occasionally the features of the patch are changed in consequence of the unusual degree of suppuration excited. In this case the pustules burst and their contents concrete into dry crusts about the stumps of shafts of surviving hairs, from which circumstance the disease has received its name (sycosis, *σύχων*, a fig). Rarely, a conglomerate crust covers the entire region with an excoriated, inflamed, and secreting surface beneath.

Formidable cases of tinea sycosis have occurred in the persons of farmers, where the disease was long untreated and unrecognized. Some severe types of the disease have been produced after shearing sheep having diseased pelts. In these cases the cheeks, lips, and chin are the seat of nut- to fist-sized and larger cutaneous and subcutaneous, soft, boggy, and pus-filled tumors, accompanied by excessive soreness of the entire throat and neck, the hair falling from the follicles in large masses, and as if lubricated to facilitate their escape.

Etiology.—*Tinea circinata* is caused by the presence of the parasite, though the parasitic invasion may be an accident of other cutaneous disorders. In the majority of cases one or the other of the trichophytions is the causative factor, only occasionally is it produced by the microsporon. The *trichophyton* was first discovered in 1844 by Gruby; though Malmsten, whose name is often associated with that of the fungus, became identified with its recognition by his observations during the succeeding year. As a contagious disease it ranks higher in the scale than favus, being much more readily communicated, and, as a result, much more common. Occurring upon the non-hairy portions of the body, it is often spontaneously removed by the desquamative process which it excites in the skin.

Though the fungus is the essential cause of the disease, its development is greatly favored or retarded by external influences. Attention has already been called to its luxuriance under the influence of heat and moisture. It is, therefore, much more severe and rebellious to treatment in tropical countries. It occasionally occurs in epidemic forms. Thus, Gerlier¹ gives the details of such an epidemic in Ferney Voltaire, where twenty-six cases of the disease came under his observation. In some of these instances the lesions were pustular, in others tuberculo-pustular. Aggravated forms of the disease often originate in the lower animals, the severest and most rebellious types being derived often from the horse. *Tinea circinata* occurs much more frequently in children than in adults, presumably from the relatively tender condition of the epidermis in these subjects. It is particularly liable to occur in men whose skins are especially moistened, as in those who work in atmospheres saturated with steam. Several members of a single household will often display ringworm of the body at the same time, having transmitted it the one to the other. The need of an appropriate soil for the germination of the fungus is shown by the fact that some individuals are predisposed to its invasion. It is, however, encountered in both sexes and in all social conditions.

Tinea tonsurans is produced usually by the microsporon Audouini. A small per cent. only are due to the trichophytions. (See introductory paragraph on Ringworm.) Ringworm is observed frequently in children of both sexes, especially in those gathered together in schools and public charities, where it may spread very generally from one to another, and require months and years for its extermination. It is a highly contagious disease, but yet requires unquestionably a suitable soil for its development. White² calls attention to the fact that when there is ringworm on the face of an adult, even of rebellious form, in the course of which the beard may be affected extensively, the scalp usually is spared. Ringworm in the scalp of the adult and the aged is, indeed, among the rarest of cutaneous accidents. Among

¹ Lyon méd., 1881, xxxvi., p. 599, and xxxvii., p. 7.

² Loc. cit., Henri Malherde, Jour. des Malad. Cutan. et Syph., 1900, s. v., xii., p. 129; abstr. B. J. D., 1900, xii., p. 306. Report of a case with generally distributed lesions on the body and scalp due to the microsporon.

the methods of transmission in children are the use upon the head of the unaffected, of brushes, combs, wearing-apparel, sponges, towels, etc., which have been employed upon persons exhibiting ringworm of the body or the head. It must be remembered that *tinea circinata* may occasionally transmit *tinea tonsurans*; and it is by tracing the course of the two forms of the disease that the sources of contagion can be ascertained in any series of cases. The disease is one rather prevailing in cities than in the country; in this respect it differs from favus.

Tinea sycosis is produced by the ectothrix or endo-ectothrix varieties of the trichophyton (see introductory paragraphs on Ringworm). J. C. White, of Boston, has called special attention to the frequency of its origin in the barber-shop, a fact which common experience verifies. It is usually the irregular visitor to these establishments who is first to supply the germs of the disease. No individual proprietorship in cup, soap, brushes, and razor can secure against the danger of infection the person whose razor is drawn over a common strop, whose cheek is handled by unwashed fingers which have recently been passed over an infected face, or whose beard is combed, brushed, or rubbed with the implements and towels in common use at these establishments.

It is difficult to determine the frequency of the disease from statistics. The affection is certainly relatively rare, yet more common

FIG. 158.



Filaments and spores of the trichophyton from the beard of a patient affected with *tinea sycosis*.

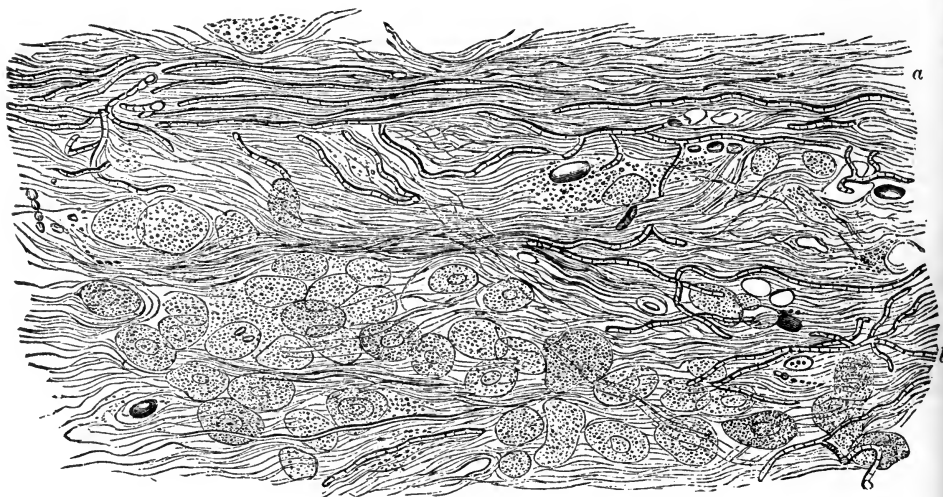
than is often supposed to be the case. It is of somewhat irregular occurrence, months often passing without a case coming under observation, after which several may be noted in rapid succession.

The disease, being contagious, is one affecting men in all stations

of life, and these usually at a period rather under than over the fortieth year. More men with light hair and eyes, and light-brown, reddish, or sandy beard are affected than those having darker shades of hair and eyes. Morris has called attention to the fact that *tinea tonsurans*¹ occurs more frequently in blonde than in brunette subjects.

Pathology.—The seat of the fungus in *tinea circinata* is between the strata of the epidermis, more particularly in the lower layers of the stratum corneum and in the superior layers of the rete. Here the trichophyton can be recognized with the microscope, at an early stage of the disease, in the form of spores only; in the course of a few

FIG. 159.



Epidermis invaded by trichophyton: *a*, inferior portion of the stratum corneum; *b*, superior portion of the rete. Both exhibit long mycelial threads, with a few ramifications and a small number of spores. (KAPOSI.)

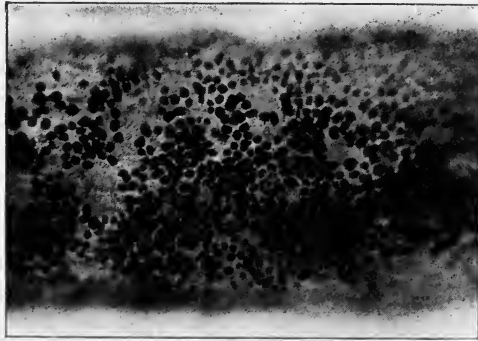
weeks exhibiting characteristic mycelium. The latter is much more scantily developed than in *favus*; much less branched and articular; and the threads more slender. Like the elements in *favus*, however, these are jointed and divided into compound cells by partition-walls. The spores are also often strung like beads on a necklace. The former measure 0.0018 to 0.0026 mm.; and the latter, 0.0021 to 0.0035 mm. (Duhring).

After the fungus has found its way to the surface of the skin favorable to its development it penetrates the layers of the epidermis in every direction from the central point of invasion, the circle thus produced being characteristic of many forms in both the higher and the lower vegetable life. The irritation excited by the presence of this foreign body produces all the subsequent symptoms of a mild grade of superficially seated inflammation: erythema, exudation, minute vesicles, papules, and, in severe grades, tubercles and pustules.

¹ Lancet, 1881, pp. 164, 241.

PLATE XLVII

FIG. 1



Portion of a Hair showing the *Microsporon Audouini*.
(From a photomicrograph.)

FIG. 2



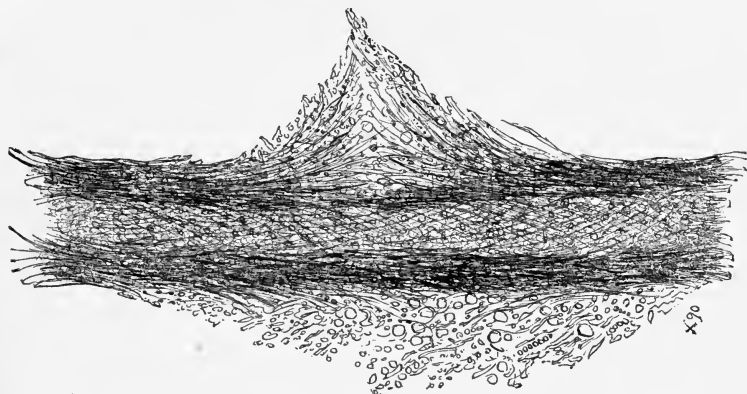
Portion of a Hair invaded by the *Trichophyton*,
Endo-ectothrix. $\times 500$.

a, a, chains of spores in focus; *b*, a chain situated farther within the hair, and hence not in focus.
(From a photomicrograph.)



The desquamative symptoms represent, in a sense, the natural effort at relief; this effort, as noted above, being often successful when the spores and sporophores are thrown off with the effete, horny plates of the epidermis. When the nails are affected the fungus can be dis-

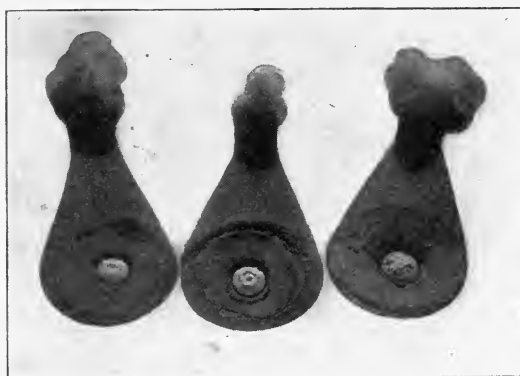
FIG. 160.



Hair invaded by the trichophyton.

covered in detritus of the nail-tissue which has been macerated in dilute liquor potassæ. Sabouraud states that only the different species of trichophyton, ectothrix pure, or endo-ectothrix, are found in ringworm of the glabrous skin and of the nails, though the trichophyton endothrix and the microsporon Audouini may be found occasion-

FIG. 161.



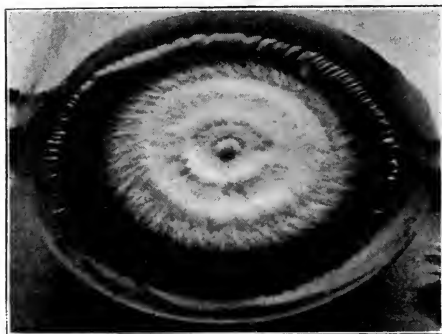
Trichophyton endothrix culture from the scalp. (MEWBORN.)

ally in small, irregular, transient, reddened, slightly furfuraceous areas occurring on the face, neck, and other parts of the body during the course of ringworm of the scalp.

Tinea tonsurans is produced in consequence of invasion of the scalp and follicles, bulbs, and shafts of the hair by the fungi already described.

Under the microscope the hairs are seen to be greatly altered in advanced cases (Fig. 160). The bulbs are distorted, misshapen, or withered, and often stuffed with spores which greatly predominate over the mycelium. At times the base of the bulb will show a brush-like expansion, and in this respect resembles the free ends of the

FIG. 162.



Culture three weeks old from ringworm of cat contracted from ringworm of girl's face. (MEWBORN.)

stumps of the hairs above, which have a jagged, bristle-like appearance, from division of the shaft into many filaments between which spores in abundance are visible. The shaft is often longitudinally split where the parasitic growth has mechanically forced apart its elements, and its cuticle may be peeled off or curled above and

FIG. 163.

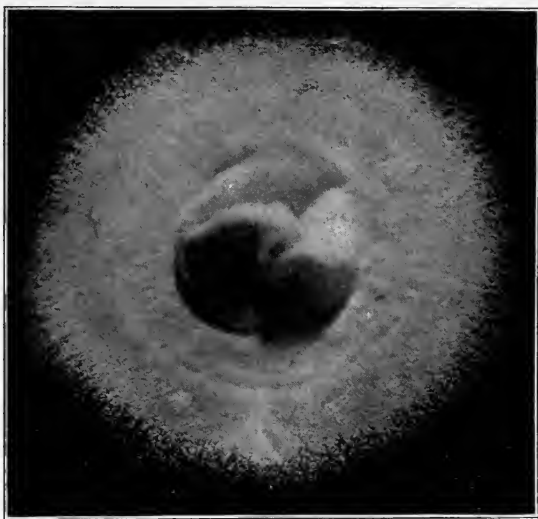


Trichophyton ectothrix culture (rose-pink in color), from a case of *tinea sycosis*. (MEWBORN.)

below away from the axis, with spores protruding at such points. Conidia can be discovered much further upward along the hair and distant from the scalp than in favus; often, indeed, upon its free surface. Occasionally a few mycelial threads may be recognized,

either longitudinally or transversely arranged as regards the axis. It is probable, however, that the relative preponderance of spores and mycelium in these filaments is determined by the stadium of the disease in any given case. In the earlier stages of the affection the elongated threads may be discovered in larger quantity, and, as they interfere less with the integrity of the fibrous tissue, the hair usually at these times may be extracted from its follicle without fracture. Later, the threads disappear, and the conidia are infiltrated throughout every portion of the shaft, which then breaks often upon the slightest traction. One unaccustomed to microscopical examinations with a view to the detection of the parasite should be careful not to mistake for these threads the delicate lines which traverse the surface of the shaft exposed to the objective, and which represent the edges of the cuticle of the hair. In doubtful cases the hair should be examined in liquor potassæ and after staining by the methods given in the first pages devoted to the subject of ringworm. The scales found upon the affected scalp also exhibit traces of the para-

FIG. 164.



Trichophyton ectothrix culture three weeks old from the case of tinea sycosis in fig. 156. (MEWBORN.)

site under the microscope, though to a less extent than the invaded hairs. In exceptional cases, however, the epidermis of the scalp seems to suffer as much as that of the non-hairy portions of the body.

As to the mode of invasion,¹ it is still disputed whether the spores

¹ Annales, May, 1907, p. 326-7; June, 1907, p. 309—Abstr. B. J. D., 1908, p. 60. Sabouraud describes in connection with the microsporon an extrapilar sheath of spores with an intrapilar mycelium. The fungus proceeds downward from the orifice to near the middle of the hair-follicle where it penetrates the cuticle and runs parallel in the hair with the long axis of the shaft. The spores are produced by the breaking up of the intrapilar and possibly by reproduction of the extrapilar mycelium.

find access to the fundus of the follicle between the shaft and the follicular wall, or by penetrating the cuticle of the hair-shaft at the level of the epidermis. It is possible that invasion may occur in both ways.

Tinea sycosis is essentially a follicular and perifollicular inflammation induced by the irritative effects of the fungus, precisely as in the case of tinea tonsurans. The difference between the clinical aspects of the two diseases may be explained by the difference in the inflammatory reactions produced by the two parasites causing the disorders. The trichophyton ectothrix which induces sycosis produces moist and actively inflammatory lesions as a rule, while the microsporon found in most cases of tinea tonsurans produces dry lesions that are only mildly inflammatory. As a result of the induced inflammation, vesicles, pustules, papules, and tubercles are formed, while the peri-follicular inflammation may invade all portions of the skin and subcutaneous tissues, gluing together the plastic nodules formed about the individual hair-sacs into the lumpy masses characteristic of the disease. The invasion of the hair follicles and hairs by the fungus is accomplished as in the case of ringworm of the scalp. Under the microscope spores and mycelium are visible, the former preponderating at the time when the disease first comes under observation, but probably preceded in most cases by abundance of thread-like forms. The identity of the disease with some forms of ringworm of the body and scalp does not, however, rest merely upon microscopical observation, but is demonstrable by established clinical facts. Not only may ringworm be seen to spread from the face to the beard, but tinea tonsurans and tinea circinata may also transmit tinea sycosis, and the reverse. A physician had ringworm of the bearded chin and cheek derived from the face of a child under his care. He subsequently gave tinea circinata to his wife, who suffered on the face and shoulder, and she, in turn, communicated tinea tonsurans to her daughter. Such cases, however, are unusual (see introductory paragraphs on Ringworm).

Diagnosis.—Ringworm of the body is to be distinguished, clinically, from eczema, psoriasis, seborrhœa, lupus erythematosus, herpes iris, and syphilis. All the varieties of eczema are noted for their greater degree of itching and infiltration, their much less defined border, coarser scales, decided absence of a circular contour and of a history of contagion. Psoriasis does occur in circular and annular patches, often with a clear centre and insignificant, subjective sensations; but its scales are lustrous and the tissue beneath them readily bleeds, showing deeper implication of the skin. The disease is often symmetrical in disposition; occurs by preference upon certain regions of the body where ringworm is relatively infrequent; and its history is that of a chronic disorder. Seborrhœa of the skin exhibits greasy or fatty crusts, which are never characterized by the peculiarly branny scales seen in ringworm of the body. (The distinction between these disorders on the scalp is given below.) Lupus erythematosus is often

symmetrical, generally chronic, and is characterized by the development of multiple annular patches, enlarging centrifugally from a clearing centre. Herpes iris can be distinguished, first, by its predilection for the extremities; second, by the color-variegations which it displays and which are never seen in ringworm of the hands. Syphilis is multiform in its lesions, usually preceded by a history of infection; and its distinctly circular patches, enlarging at the periphery, all exhibit either atrophic, ulcerative, or distinctly crusted lesions which suffice for diagnostic purposes.

Pityriasis rosea is not characterized by vesicles; is often symmetrical in development; occurs in oval rather than in distinctly circular patches; and exhibits a characteristic tawny-yellowish shade of color not seen in ringworm. In eczema marginatum the elevated border and infiltration of the diseased surface, its situation (groins, armpits, pubes, etc.), its curved outlines, and the occurrence of fresh rings within the older, point to the nature of the trouble, which is practically a coexistence of ringworm and dermatitis.

But the microscopical discovery of the parasite is the chief, and, indeed, the essential, method of diagnosis in *tinea circinata*. With a good fourth- or fifth-inch objective the spores and mycelium are readily recognized in the scales scraped from the affected surface and moistened with dilute liquor potassæ. Care should be had in distinguishing the fungous elements from cotton- or wool-fibres, fat-globules derived from previously applied unguents for the cure of the disease, sebum, pus, and the nuclei of epithelia. All confusion of this sort can be avoided by a careful study of the anatomical peculiarities of the trichophyton, recalling especially the parallelism seen in the double contours of the threads, their jointed appearance, their contained granules, and the necklace-like or beaded arrangement of many spores.

The recognition of a typical patch of ringworm of the head is simple. The branny scales, clumps of hairs, and distinct contour of the invaded area are always in the highest degree suspicious symptoms. It has been stated, however, that the general development of *tinea tonsurans* over the scalp produces a condition very like that seen in other diseases. In this case the microscope must be employed for a decision as to the nature of the process. The whole vertex has been unnecessarily epilated in *seborrhœa sicca* when no parasite could be found; but in *seborrhœa* there is usually a symmetry of involvement which even aggravated cases of ringworm of the head fail to assume; and even though pasted down, atrophied, changed in color, and loosened in their follicles, the hairs are rarely broken off near the scalp in *seborrhœa*. In *seborrhœa*, *psoriasis*, and *squamous eczema* of the scalp there is, moreover, no history of contagion; the scales are in each disease different in color and character; and the hairs in the two affections last named are firmly fixed in their follicles, and only in severe cases present nutritional changes. The diseases, moreover, are usually chronic in their course. In any doubtful case, apart

from microscopical evidence, thorough removal of all scales from the scalp by shampooing with green soap and hot water will reveal the nature of the disease present.

Alopecia areata, as has been noted above, may coexist with ringworm, but it is pathologically distinct from it. The patches in the first-named disease are uniformly smooth, and the hair falls from them *en masse* without scaling or other traces of previous involvement of the regions affected. Blackish points or dots may, however, be distributed over the areas which characterize this form of alopecia, and which certainly constitute suspicious symptoms in any case. In this event one may at times be able to pick out with a fine needle this blackish point from the patent follicular orifice, and find it to be a particle of dust accidentally lodged in the depression. It is not, as in comedo, free pigment that has found its way to the surface; nor, as in ringworm, is it the stump of a hair on a level with the surface of the scalp. In favus the cup-shaped crust will sooner or later betray the character of the disease to the naked eye.

Confirmatory evidence as to the nature of the disease will often be furnished by a careful search for the source from which it was derived; and for obvious reasons this should always be attempted. Ringworm of the body occurring upon the individual patient affected with tinea tonsurans, or upon other members of the same household, and suspicious "mangy" patches upon horses, dogs, cats, rabbits, white mice, or other animals with which the child may have been in contact, should always receive attention.

Ringworm of the bearded region is to be differentiated chiefly from coccogenous sycosis; and, necessarily, the microscope must be employed to settle the question definitely. The diseases, however, differ in their clinical features. The coccogenous form always fails to exhibit the nodules, tubercles, and composite cutaneous and subcutaneous agglutinations of the disease produced by the fungus. The process in the former is more superficial, and it exhibits to the eye a more vivid redness as a result of the cutaneous hyperæmia. Owing to the same cause, the frequent pus-containing lesions are developed and elevated above the general level of the integument; they are less commonly subepidermic crypts filled with characteristic mucoid puriform contents. The region of the bearded upper lip, so often involved in cases of nasal catarrh, is often spared by the trichophyton. When this parasite is present the hairs are characteristically loosened, distorted, and otherwise changed. This condition is not seen in the coccogenous disease; exception, however, in this particular is to be noted in some long-standing cases of the latter. When the affection has persisted for many years (and one may often see patients thus affected) the thinned and starved condition of the pilary growth is a striking symptom, the scanty lustreless hairs often scarcely sufficing to conceal the deforming redness and pustulation of the surface from which they spring. The diffuse symmetrical affection of the hairy face, extending over both cheeks and chin, is more fre-

quently connected with the presence of pus-cocci. Lastly, the hyphogenous, as a rule, is less painful and tender than the other form of sycosis, and, furthermore, is, without question, of rarer occurrence.

With respect to syphilis, it is to be noted that the papular or the pustular syphiloderm developed in the region of the beard is, almost without exception, to be discovered in other parts of the body, especially the scalp. Ringworm of the scalp and the beard existing at the same time in one individual is rare. In syphilis there is usually an offensive odor to the abundant crusts; shallow ulcers are also prone to form beneath the pustules; and there is often a history of infection or a hint of the nature of the disease in its polymorphic character.

Eczema of the bearded region may extend to or from other portions of the face, as in a case in which it sweeps from the ear above. The presence of a stalactitic crust depending from the lobe of the ear of an affected side would at once furnish a clue to the nature of the disease in the beard. In eczema the interfollicular region is invaded, not deeply, as in tinea, but superficially, as in coccogenous sycosis. The itching is severe; the hairs are not involved; the infiltration is diffuse; the outline is indeterminate; and a halo of redness spreads from the affected part to the non-hairy surface in the vicinity.

Treatment.—The indications in the treatment of ringworm of the body are the removal of the superficial layers of the epidermis, by which means the spores and mycelium are thrown off from the surface; and, if possible, the simultaneous destruction of the latter. Upon the delicate skins of infants and children the simpler remedies are first to be employed. Scrubbing each patch with spirit of green soap, or merely soap and water, will often suffice for its obliteration. The topical application of tincture of iodine is a common and usually an effective remedy. Sabouraud¹ states that tincture of iodine diluted with five times its volume of alcohol gives better results than the pure tincture of iodine. Dilute acetic, boric, and carbolic acids, or a 1 to 2 per cent. solution of formalin are available. A solution of acetic acid used with or immediately before other parasitocides is said to favor penetration of the latter. Morris's solution of thymol,² $\frac{1}{2}$ drachm to 2 drachms (2. to 8.) of chloroform and 6 drachms (24.) of olive-oil, is equally available. One may also use thymol in ointments, $\frac{1}{2}$ drachm (2.) to the ounce (30.) of simple unguent, with good effect. Of the mercurials, ammoniated mercury, 1 scruple (1.33) to the ounce (30.) of ointment; corrosive sublimate, 1 to 2 grains (0.066–0.133) to the ounce (30.) of solution; and the ointment of mercuric nitrate, 1 drachm (4.) to the ounce (30.) of vaselin, are valuable. Sulphurous acid, from a freshly opened can, and saturated solutions of sodium hyposulphite are as effective as any of the parasitocides, and are often used with advantage as lotions, to be followed by an appropriate unguent, always providing against chemical decomposition of the ingredients of the latter. Sulphur-

¹ Brit. Med. Jour., 1908, Oct. 8, pp. 1089, 1094.

² Lancet, 1881, i., pp. 164 and 241.

and tar-containing lotions and unguents are useful in more obstinate cases.

Chrysarobin and pyrogallol, in ointment, from 5 to 10 grains (0.33–0.66) to the ounce (30.), are brilliantly effective in all these cases, subject, however, to the disadvantage incidental to the staining and irritative effects they produce. They should be used with caution upon the skins of children, and always tentatively at the onset. Chrysarobin used in the strength of 1 to 5 per cent. in traumaticin is a valuable application and has the advantage of being retained in the area applied. In cases of ringworm of the face of male adults, close to the beard or the scalp, one may employ these remedies with a view to insure non-invasion of the pilary follicles by the fungus, the prompt destruction of which may become then a matter of urgency. Wilkinson's ointment recommended by Kaposi is also useful in the treatment of aggravated forms of ringworm of the body, but it should be restricted to such forms. For other and more urgent reasons potassium hydroxide solutions should be reserved for exceedingly intractable cases. Sometimes a combination of several of the simpler remedies named above may be serviceable, as in the following formulæ:

℞	Lac. sulphur.,	3ijss;	10	
	Sapon. virid. spts., }	āā 3vj;	āā 24	
	Lavandul. tr., }			
	Glycerin.,	3ss;	2	M.
			[Kaposi.]	
℞	Iodin. pur.,	3ij;	60	
	Ol. picis [sp. gr. 0.853],	3j;	30	M.
Mix	with care, gradually.			
℞	Creasoti,	℥xx;	1 33	
	Ol. cadini,	f3ij;	12	
	Sulphuris præcip.,	f3ij;	12	
	Potass. bicarb.,	3j;	4	
	Adipis,	3j;	30	M.
			[Van Harlingen.]	

To be used in obstinate ringworm of adults.

R. W. Taylor applies mercuric chloride, 4 grains to the ounce (0.266–30.) in tincture of myrrh. Perry, of California, uses the bichloride in one-half the strength last named, dissolved in sulphuric ether. Foulis, of Edinburgh, recommends iodine dissolved in oil of turpentine or benzin, the fluids named penetrating with greater ease than others to the deeper portions of the skin.

Other articles advised are oleates of mercury and copper, croton-oil, glacial acetic acid, cantharidal collodion, petroleum, and pyroligneous acid (Thomas).

The thorough application of the remedy selected for use, upon the integument freed from scales by scrubbing with soap and water, is a matter of importance. When a solution of sodium hyposulphite is employed the previous application of vinegar and water by sponging renders the agent more effective, for evident chemical reasons. Over-

treated skins, or those to which too strong a parasiticide has been applied, require subsequent relief of the induced irritation by the simpler bland dressings. The inert dusting-powders, even when not thus indicated, are often useful when there is distinct vesiculation; and in simple cases they may be the sole remedies required, as then the disease is self-limited in duration.

The internal treatment of patients affected with ringworm, by means of tonics and roborant measures, may be demanded by the systemic condition, but it has no recognized influence over the disease itself.

When the nails are involved, they should be thoroughly scraped and then kept moist by wearing the rubber cots sold for the use of sportsmen, fishermen, and others. In this way a partial maceration of the nail-substance is secured, and the action of any one of the parasiticides named above is greatly aided. One of the solutions most useful in the treatment of the nails is that recommended by Sabouraud, containing 1 gramme of iodine and 2 grammes of potassium iodide in a litre of distilled water.

The indication for the relief of the disease in the scalp is the destruction of the parasite; and there can be no question that this may be accomplished in some cases without having recourse to epilation. The parasiticides named in connection with ringworm of the body, if thoroughly applied in simple cases, after clipping or shaving the hair and efficient scrubbing of the patch with spirit of green soap and water, will occasionally be followed by permanent relief. Prominent among these parasiticides may be named formalin (1 to 5 per cent. in aqueous solution), pyroligneous acid, sulphurous, acetic, salicylic, and boric acids, saturated solutions of sodium hyposulphite, acetum cantharidis, tincture of iodine; Crocker's ointment containing thymol, 1 part to 4 of salve-base; Morris's solution of thymol in chloroform and olive-oil (see above); and ointments of boric acid and sulphur, of each 1 drachm (4.) to the ounce (30.) of vaselin, and chrysarobin, the action of the latter being carefully limited to the patch of disease by the aid of a skull-cap.

Epilation, however, is a valuable, and often an essential, method of treating the disease, and it may be practised as recommended when considering the treatment of favus. The scalp in each case should first be oiled, and be cleansed by the soap-shampoo, and after the epilation is performed an appropriate parasiticide should be employed. The calotte, made by spreading pitch-plaster upon leather or muslin, is a clumsy substitute for epilation in order to remove the hairs, but the sticks recommended by Bulkley may be employed, the formula for the preparation of which has already been given. In each case the epilation should remove a zone of sound hairs encircling the diseased patch, that the encroachments of the fungus may in every possible way be limited. It should not be forgotten, however, in the treatment of tinea tonsurans by both epilation and parasiticides that in chronic cases these methods in the hands of the most expert have failed for

consecutive months to relieve radically the disease; that even the most inveterate cases in the course of time and as adult years are reached, are relieved spontaneously without permanent alopecia; and that no remedy or procedure is ever justifiable which is capable of either producing follicular atrophy or an effect worse than that wrought by the disease itself. Sabouraud¹ recommends *x*-rays above other measures. Many others have followed his technique with good results. Although the method appears favorable it cannot be advised for general use owing to our inability to accurately measure the dosage even with all the modern appliances used for this purpose.

Jackson² recommends an ointment containing a drachm (4.) of iodine crystals in an ounce (30.) of goose grease. This is rubbed into the scalp twice a day until swelling is produced. An alopecia follows but the hair returns. Levan³ applies oil of turpentine on linen twice a day for a week, or until inflammation occurs. Exfoliation follows, the subsequent treatment being the application of a simple ointment. Hodara⁴ applies daily, after shaving the hair, from 5 to 10 per cent. of chrysarobin in equal parts of glycerin and chloroform. On the production of erythema and oedema the treatment is suspended until the irritation has subsided, and then is renewed. Four or five months are necessary for a cure. Sabouraud⁵ prescribes the following method: The scalp is shaved and the hair epilated from the diseased area and from a zone 4 or 5 mm. wide surrounding it. Every second evening the entire scalp is rubbed thoroughly with 60 per cent. alcohol containing 25 per cent. of pure iodine; beginning areas of the disease not visible to the unaided eye are stained by the iodine and can be recognized easily. On alternate evenings an ointment containing pyrogallac acid, 15 grains (1.); oil of cade, 1 drachm (4.); and vaseline, 5 drachms (20.), is applied. The scalp is washed each morning with soap and hot water. If this treatment fails to produce a follicular inflammation, croton oil is added to the ointment.

Coster's paste is popular among English practitioners, including Stowers, Fox, Liveing, and others. It contains 2 drachms (8.) of iodine in crystals, dissolved in one ounce (30.) of oil of tar; and is painted over the part at intervals of a few days. It is most useful in circumscribed patches of the disease. Among other remedies employed, some of which have been described in connection with ring-worm of the body, may be named mercuric chloride, ammonio-chloride, red oxide, oleate, and ointment of mercuric nitrate; epispastics; pure carbolic acid and carbolated glycerin; sulphur, chloroform, ether, tar in ointment, and Wilkinson salve.

To be effectual the treatment pursued must be persistent and thorough, and always be accompanied by frequent washings and soapings of the affected part.

¹ B. J. D., 1906, xviii., pp. 199, 214. A complete discussion of the subject with interesting details as to technique, apparatus, and results are given.

² N. Y. Med. Record, 1902, lxi., p. 164.

³ Jour. Mal. eutan., 1901, xiii., p. 241.

⁴ Monatshefte, 1903, xxxvii., p. 118.

⁵ La Pratique Dermatologique, iv., p. 508.

The induction of suppuration in the hair-follicles (or a species of artificial kerion), by the aid of electrolysis and croton-oil liniment, has been praised by Alder Smith and Wyndham Cottle, of London, and later, in a modified form, by Magee Finny, of Dublin. By the process of Finny, 100 parts of the oil are mixed with 50 each of cocoa-butter and white wax. Sticks are made of this compound which can thoroughly be rubbed into the part affected. By both methods it is claimed that no pain is produced, nor is permanent alopecia the result. A solution of salicylic acid is applied after each treatment, and a subsequent poultice may also be needed. In these cases the parasite is destroyed presumably by the suppuration excited. As in the case of ringworm of the body, tinea tonsurans is not remediable by internal treatment. Such internal medication, however, may be indicated by the systemic condition of young patients, and should be in each instance such as that condition suggests.

The treatment of kerion is either by the milder parasiticides or by the methods proper for the relief of ordinary phlegmonous inflammation of the scalp, according to the stage of the kerion. The pus-cocci present in some of these cases require boric-acid lotions and bichloride washes.

The treatment of tinea sycosis is conducted generally as in tinea tonsurans. It is customary to begin by anointing the affected surface with an oily or fatty substance, and to follow this with a shampoo of soap and warm water for the removal of crusts, after which shaving and epilation are practised on alternate days; and parasiticides employed locally. For softening the crusts the spray of an atomizer may be used.

Epilation of the male beard is often essential for removal of the disease, but the results of the treatment suggested below in the end may be satisfactory.

The patient for two successive days keeps the affected part macerated with almond- or olive-oil. On the evening of the third day the shampoo with soap is employed, and the skin is washed free from crusts and scales. The part is then cleanly shaved. This operation is at first painful, but gradually becomes less distressing. After shaving, the affected surface is bathed for ten minutes with borated water as hot as can be tolerated, by which means the inflammatory condition of the perifollicular tissues is, in a brief time, considerably reduced. While the bathing is in progress all subepidermic pustules or points where a mucoid fluid is coming to the surface are opened with a fine aseptic needle. A solution of sodium hyposulphite is then sponged freely over the affected surface for several minutes and allowed to dry; this solution may contain 1 drachm (4.) to the ounce (30.), or even more. After a thorough and final washing with hot water the tender skin is carefully dried and gently smeared with a sulphur ointment containing 1 to 2 drachms of sulphur (4.-8.) to the ounce (30.) of vaselin, often with the addition of from $\frac{1}{4}$ to $\frac{1}{2}$ (0.016-0.033) grain of mercuric sulphide. The patient then retires to bed. In the morn-

ing the unguent is washed off with soap and water, the sodium-solution is reapplied, and a borated or a salicylated powder is thoroughly dusted and kept over the part during the day. In the evening the shaving may be repeated or not, according to the vigor with which the beard is reproduced, but on the second day shaving is imperative. As soon as the pustulation ceases and the tubercles have manifestly diminished in size the ointment at night is superseded by the use, at that time also, of the dusting-powder. Whether the shaving is practiced nightly or on alternate nights, ablution with very hot water and with solution of sodium hyposulphite is continued nightly until the inflammation excited by the fungus is practically limited to the follicles that are invaded. The dusting-powder is to be thoroughly and constantly employed after the ointment is discontinued. In many cases good results may be obtained by following the above technique, substituting a 1 to 2000 solution of mercuric chloride for the boric acid bath and sodium hyposulphite solution, after which an ointment is applied containing $\frac{1}{2}$ to 1 drachm (2.-4.) of hydrargyrum ammoniatum to the ounce (30.) of adipis in place of the sulphur ointment. With care and patience these measures may save many patients the annoyance of epilation; and they should be continued for several weeks after apparent relief of the disease.

The treatment may be varied to suit the needs of individual cases. Kaposi highly recommends, for example, 1 per cent. solutions of corrosive sublimate locally; and the other parasitocides considered heretofore in connection with the treatment of ringworm may serve also a good purpose. In some cases an ointment of thymol may be used with manifest advantage; in others, a substitute may be found in Morris's solution of the same in chloroform and oil (the formula for this has already been given). In still other cases spirit of green soap with sulphur, finely powdered sulphur, boric, acetic, and carbolic acids, or other topical applications of recognized value may be employed.

When resort is had to epilation, and this is essential in all severe cases, the hairs should be thoroughly removed from their follicles over every lumpy nodule, and even over every suspicious patch covered with scales. A zone should be cleared about each such papule. The results are prompt and in the highest degree satisfactory.

Prognosis.—*Tinea circinata* is often self-limited, and is generally under the simplest treatment satisfactorily relieved. *Eczema marginatum*, especially in the crural region, may be obstinate, because it is an eczema as well as a parasitic disease, and, therefore, subject to the relapsed and chronic phases of the first-named disorder. Other intractable forms of the malady do, however, occasionally occur in adults, usually in tropical climates and tropical temperatures.

The prognosis in every judiciously treated case of *tinea tonsurans* is favorable, since all patients ultimately recover from the disease *per se*. Under the best treatment many cases prove extraordinarily tedious, month after month passing without marked improvement.

The disease, however, in a large proportion of cases among children surrounded by proper hygienic conditions, especially as regards cleanliness, is readily relieved.

Tinea sycosis is always remedied sooner or later, though it is at times tedious in its progress and characterized by relapses.

Precautions to be Observed in the General Management of Tinea Favosa and Tinea Trichophytina.¹—The physician consulted in the case of a patient affected with either of the diseases thus far considered as resulting from the presence of a vegetable parasite should bear in mind that they are the most contagious of their class. He may not only himself suffer from the disease which he is attempting to relieve in another, but may also convey it to others, or be consulted by others of his patient's family actually infected during the course of the treatment pursued.

Generally, it may be said that the hands of the physician should carefully be washed after each manipulation of the part, and preferably with a weak disinfecting solution. In the case of children the lining of all caps, hoods, and other coverings of the head should be removed and destroyed by burning; and fresh linings made of tissue-paper renewed daily; while paper-caps of the same or of similar material should be worn when indoors. Brushes, combs, towels, and articles of clothing should never be used in common by two or more individuals. When practicable, infected individuals should occupy separate beds; and the bed-covering, clothing, toilet-apparatus, and dressing or other materials which have been in contact with a diseased surface should be immersed in boiling water before they are again employed for any use in common. Thin recommends covering every diseased patch, after the treatment appropriate to itself, with an adhesive and impermeable dressing, for the sake, not of the patient, but of those with whom the latter may be brought in contact; and the suggestion is both wise and practicable. A man infected with ringworm of the beard in a barbershop which he has visited but once, will often, when directed by his physician to shave, resort to some other establishment, where he is well known, and where he has more confidence in the cleanliness of the operators. In this way he often thoughtlessly spreads the disease of which he is the victim. It is well to send patients who cannot shave themselves to a particular barber, who, being instructed in the manner of shaving so as to insure immunity, generally fails to spread the disease in any case.

The physician should, in this connection, for medico-legal reasons be upon his guard against hastily deciding both as to the nature of the disease of his patient and the source from which it was derived. Of the first, he can become certain by his microscopical investigations; of the second, he can only be sure by obtaining possession of facts far beyond the reach of the average practitioner. A medical gentleman once sent for examination some hairs from the beard of

¹ Cf. Corlett, J. C. D., 1900, xviii., pp. 315 and 360.

a male patient affected with tinea sycosis. Before receiving a report confirming the diagnosis this physician was sued by the barber in whose establishment the disease had been probably acquired, on the ground of libel.

TINEA VERSICOLOR.

(PITYRIASIS VERSICOLOR, DERMATOMYCOSIS FURFURACEA, MYCOSIS MICROSPORINA, CHLOASMA. *Ger.*, KLEINFLECHTE.)

Symptoms.—The eruption in this disorder occurs in the form of few or of many, irregular, roundish, circumscribed or reticulated macules, pinhead- to small-coin-sized, rarely occupying an area the size of the palm or larger. In color it varies from the most delicate buff or fawn shade to a reddish, deep-brown, and even blackish hue. The surface of each lesion, when closely inspected, is usually seen to be covered with furfuraceous scales. If the scales are not visible slight erosion with the finger-nail or the curette will demonstrate the fact that the superficial layers of the stratum corneum are, in the site of each lesion, readily separable from the tissues beneath. The eruption is most common upon the anterior surface of the thorax; but it is displayed also upon the neck, the dorsum, the abdomen, and the other regions of the trunk, and the flexor aspects of the upper extremities (the hands only excepted). It rarely is seen upon the lower extremities; still more rarely on the face; and on the hands and feet.¹ The eruption is either unproductive of sensation or is accompanied by a mild pruritus. Patients usually declare that after profuse sweating, bathing in warm water, or brisk friction of the surface minute epidermal rolls separate from the affected area. The disease may linger for years upon the surface of the body. It has a special tendency in susceptible individuals to recur after removal.

The eruption is occasionally encountered in extreme development. In a young married woman who had been the subject of the disease for many years the entire trunk, the axillæ, the groins, the upper portion of the thighs, the neck to the level of the high collar worn, and the upper extremities to the wrists, were encased in a uniform sheet or cuirass of chocolate-tinted epidermis in a condition of exfoliation in finger-nail-sized lamellated flakes. Even in these extreme cases the tendency of the disease to avoid surfaces exposed to the light is distinctly manifested. Unna² describes an anomalous feature of the disease, in which the maculations occur in annular form with a clearing centre. Rarely, also, a very few irregularly distributed macules may be seen as the sole evidences of the existence of the parasite. Thus, a patient may exhibit a small-coin-sized patch on the surface of the chest, another on the shoulder, and possibly a third over the deltoid region of one arm. These are generally cases partially relieved of a more diffuse eruption. More commonly the slightest manifesta-

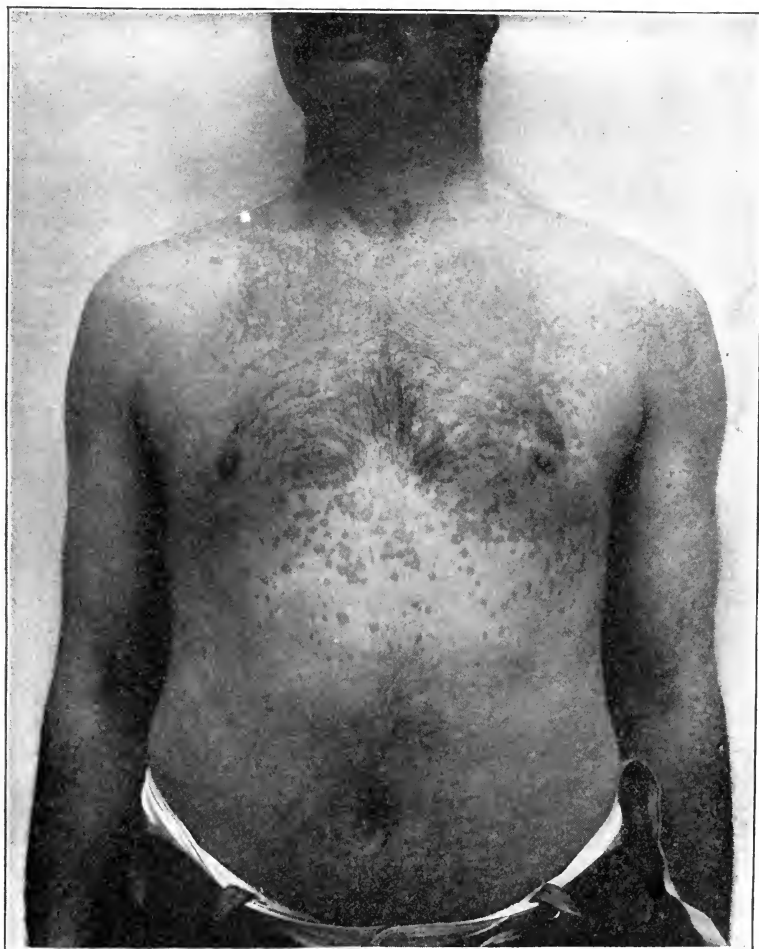
¹ E. O. Smith, *N. Y. Med. Jour.*, 1896, lxiv., p. 583, reports a case in which the disease was limited to both soles; and Gottheil, *N. Y. Med. Rec.*, 1899, lvi., p. 15, a case in which the left palm was involved.

² *Vierteljahr.*, 1880, xii., p. 165.

tion of the malady is an irregular, vertically arranged, somewhat narrow band of lesions immediately over the sternum, and visible beneath the hairs of that region in the adult male, or upon the intermammary sulcus of women. The face, hands, palms, soles, hairs, hair-follicles, and nails are usually exempt.

Etiology.—The disease is produced by a vegetable mould, discovered in 1846 by Eichstedt, to which Robin gave the name *Microsporon*

FIG. 165.



Copyright 1900 G. H. Fox.

Chromophytosis guttata. (From Dr. G. H. Fox's Atlas of Skin Diseases.)

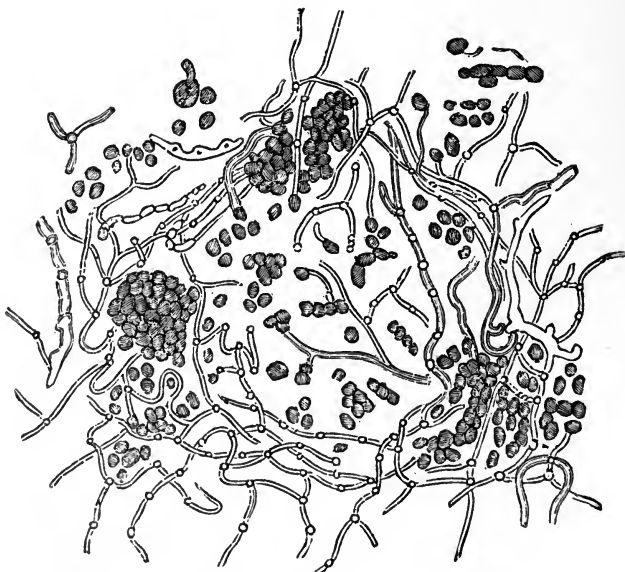
furfur. In capabilities for contagion it is far inferior to the vegetable parasites already described, and it illustrates well a point to which attention already has been directed, viz., that these fungi flourish only in soils suitable for their germination and fructification.

Members of one family are said to communicate the disease occasionally, the one to the other; and Lancereaux¹ reports that in this way he accidentally infected himself from scales collected for examination from a patient in hospital, and afterward unwittingly transmitted the affection to his wife. The disease occurs in both sexes, rarely before puberty and after middle life, and in persons of every social condition, irrespective of personal cleanliness. It is exceedingly common, more so, indeed, than statistics are capable of demonstrating inasmuch as hundreds who are annually annoyed by it never seek professional advice. In physical examinations made with a view to the enlistment of men for military service, as also of government pensioners, the disease is often recognized upon the persons of those who pay no attention to its presence. Being concealed by the clothing and unproductive of much discomfort, many subjects of tinea versicolor endure its presence with complacency.

By some it has been supposed that the fungus selects the chest of the phthisical as its habitat, a supposition doubtless based upon the fact that tuberculous men and women, more than all others, expose the chest to the view of medical men in order to permit of its auscultation and percussion.

Pathology.—The *Microsporon furfur* (Fig. 166) is readily recognized with the aid of the microscope, as it exists in luxurious profu-

FIG. 166.



Microsporon furfur. (After Kaposi.)

sion upon every affected surface. The scales may be scraped from the skin, placed on a slide moistened with a 1 to 10 per cent. solution of

¹ *Traité d'Anatomie pathol.*, xi., p. 265. Paris, 1875.

potassium hydrate and at once be examined, when innumerable clustered spores and short threads become visible; the former highly refractive and resembling in their circular and oval contours droplets of oil. Their aggregation in clusters is distinctive of this among the other forms of cryptogamic vegetation. They measure 0.0023 to 0.0084 mm., while the hyphæ vary in diameter from 0.0015 to 0.0038 mm. (Duhring). Among the latter, sporophores are distinguishable, with contained conidia and terminal elements emerging at one extremity or the other of the spore-case. Both elements are stained more readily by eosin and methyl-violet than those of the trichophyton or of favus. By the use of special media, Matzenauer¹ and Gastou and Nicolau² have succeeded in cultivating the fungus.

One of the strongest arguments against the claim for the identity of all the vegetable parasites is furnished by the history of this interesting mould. It never by any possibility invades the hairs or the hair-follicles, though it may be seen flourishing at the orifice of a follicular duct, and even beneath a vigorous pilary growth upon the chest of a male subject. It avoids light and air; and singularly refuses to encroach even upon certain covered portions of the body, preferring, in its extreme development, to linger unobtrusively at the neck near the verge of the collar.

Diagnosis.—In this disease, as in all parasitic affections of vegetable origin, the microscope may be required to decide the diagnosis in any case in which doubt arises. In its simpler manifestations the recognition of the affection is readily assured. The location of the eruption, its irregular reticulations, its characteristic yellowish or fawn-tinted shades of color due to the nature of the fungus, and the exfoliation of the epidermis which it excites by its superficial penetration of the outer layer of the stratum corneum, producing thus a mealy, branny, flaky, or roll-like exuvium, are all significant. None of the chloasmata due to pigment-changes in the skin, however much they may resemble *tinea versicolor* in color, share with it this peculiarity of desquamation. Chloasma may involve, moreover, the face; *tinea versicolor* almost never. Vitiligo occurs upon the scalp; *tinea versicolor* very rarely. The macular syphiloderm may be mistaken for the disease under consideration, but, when developed to such an extent as to rival *tinea versicolor* in its diffuseness, the syphiloderm will creep out over the face, the hands, and the feet, and will be accompanied by adenopathy, alopecia, mucous patches, palatine hyperæmia, or will furnish evidence of a polymorphic tendency. Often, indeed, with such an eruption, the survival of the initial sclerosis will at once betray the nature of the disease. These are important considerations, since in the mere matter of subjective sensation, color, shape, and size of lesion there may be marked resemblance between the two. Patients exhibiting the lesions of *tinea versicolor* may suffer from syphilis; and many having the former disease, in consequence of a sus-

¹ Archiv, 1901, lvi., p. 163.

² Bull. de la Soc. franç. de Dermat., 1902.

picious exposure believe they are infected with lues, and yet indeed are not. These incidents serve to illustrate the importance of making an accurate diagnosis in every case of cutaneous disease.

The most common error committed in this connection, however, is based upon the fancied resemblance in color between the patches of tinea versicolor and either the liver itself or the color-changes which disease of that viscus is capable of producing in the skin. The existence of "liver-colored" spots in the skin is, hence, erroneously attributed to hepatic disease. Few patients consult physicians for relief of this disorder who have not a belief in the internal origin of the disease.

Treatment.—A single method of relieving tinea versicolor is recommended for the simple reason that it invariably is successful. It requires merely vigorous and intelligent coöperation on the part of the patient. A hot bath is taken, if possible, for three nights in succession, and when the surface is well macerated in hot water the affected skin is scrubbed either with the cheap yellow soap of the shops, or with *sapo viridis* in substance or in tincture. When the disease is extensively developed this process is aided by friction with a flesh-brush or with a coarse towel. The skin is then washed clean with a surplus of hot water, and dried, after which the affected patch is first moistened with vinegar and water, or dilute acetic acid, and afterward well sponged with a solution of sodium hyposulphite, 1 drachm (4.) to the ounce (30.) being usually sufficient. As a rule, the greater part of the eruption is removed with the third application. If there be recrudescence in isolated patches, as is often the case, or outlying areas which have withstood the parasiticide employed, they should subsequently be attacked with a solution of mercuric chloride, 1 to 2 grains (0.066–0.133) to the ounce (30.). Other measures, however, are popular with physicians, and among them may be named the topical use of boric, carbolic, or sulphurous acid; tincture of iodine; sulphur in bath, ointment, or lotion; calomel in ointment; the alkalies in bath or lotion; potassium sulphide in bath; chrysarobin, pyrogallol, tar, Wilkinson's salve, and the other parasiticides employed in the treatment of ringworm of the body. Leven¹ secures an exfoliation of the skin and a removal of the disease by embrocation of oil of turpentine four or five nights in succession. Whatever parasiticide be employed, after treatment the inner clothing should not be worn until it has been immersed in boiling water.

The following formula is also recommended:

℞ Hydrarg. chlorid. corros.,	℥j;	133
Saponis viridis,	ʒij;	60
Spts. vin. rectific.,	ʒiv;	120
Ol. lavandul.,	fʒj;	4
		M.
		[Anderson.]

Prognosis.—The disease can readily be relieved by simple treatment. Relapses often occur, and require to be radically treated.

¹ Monatshefte, 1901, xxxii., p. 197.

Untreated, the disease may continue for years without the slightest impairment of the general health. It is probable that when untreated the parasite undergoes spontaneous exfoliation in advanced years, a period when presumably the fungus fails to find in the epidermis the nutriment upon which it thrives.

ERYTHRASMA.¹

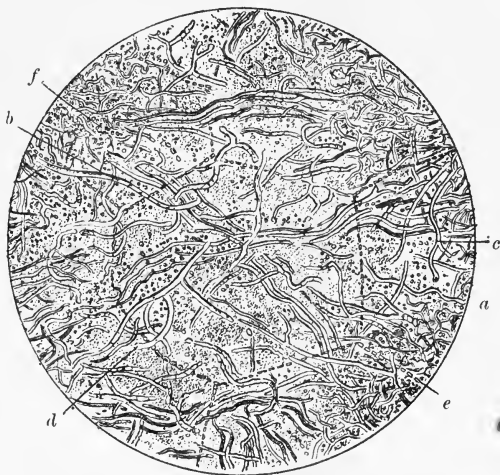
(Gr., *ερυθρός*, red.)

Burckhardt first described this disorder in 1869, but it received its name in 1862 from von Bärensprung. It has since been studied and described by Balzer, Riehl, Koebner, Pick, and others.

Symptoms.—The disease first appears in punctiform to palm-sized, roundish, definitely circumscribed maculations, presenting a sharp contrast in color with that of the adjacent integument. This hue varies somewhat according to the location of the patches. The younger lesions may exhibit a vivid redness over the entire macules or over their borders only. The older lesions exhibit a yellowish or a brownish tinge. These colors are compounds of ordinary erythematous redness and yellowish or brownish discoloration of the horny layer of the epidermis.

The macules are circular or rosette-shaped, or they display very irregular outlines. They are not raised to any extent above the gen-

FIG. 167.



Microsporon minutissimum, from patches of erythrasma.

eral level of the skin, though the finger passed over the surface can recognize a slight elevation of the border, due to hyperæmia, and subsequent moderate, flour-like furfuraceous desquamation most conspic-

¹ Cf. Payne, *Some Rare Diseases of the Skin*, London, 1899 (review of literature); Balzer, *La Pratique Dermatologique*, ii., p. 540 (bibliography).

uous also at the periphery. Vesiculation and papulation do not occur. The colors recognized in different patches may be light reddish-brown, pale reddish-yellow, and light or dark orange.

The eruption is most commonly encountered where apposed surfaces of the skin come in contact, as in the axillæ, the groins, the cleft of the nates, and the regions where the scrotum touches the thigh; it occurs, however, in typical expression on both sides of the chest. The eruption spreads slowly and in serpiginous outline until the affected surfaces are completely invaded. It is much more chronic in its course than the other dermatomycoses, lasting for months and years without apparent change.

Etiology.—Erythrasma is produced by the growth, in the superficial layers of the epidermis, of the fungus described below. Men are much more often affected than women; children not at all. The youngest patient whose case is recorded was sixteen years old; the oldest fifty-five.

Pathology.—The fungus termed *Microsporon minutissimum* (Fig. 167), to which the disease is attributed, is chiefly remarkable for the extraordinary delicacy and fineness of its threads and its very minute spores. The threads are either simple cylindrical bodies of variable size, or they may exhibit partition-septa; they may divide dichotomously, and may terminate in hooked or knobbed expansions. They are inextricably interwoven when occurring in large masses. The largest transverse diameter is $0.6\ \mu$; in length the mycelium presents the greatest variation. Bacteria and heaps of zoöglæa are visible among the scales. The granules are piled into irregular heaps according to Burekhardt, and they give a dusty appearance to the epidermal cells on which they lie; often the outline of these granules is indistinct. According to the same observer, the breadth of the hyphæ is $\frac{1}{200}$ mm.; and the length from $\frac{1}{15}$ to $\frac{1}{200}$ mm.

Pasquale de Michèle¹ discovered the leptothrix in cases of supposed erythrasma; and this is but another of the proofs that in all diseases of this class, as in so-called "eczema marginatum," there are few instances in which a single mould-fungus develops on the body surface. The entire flora dermatologica of Unna may be effective in more cases than is commonly believed.

Diagnosis.—From all ordinary chloasmata and pigment-macules the spots of erythrasma are distinguishable by the ease with which the superficially embrowned epidermal layers are removed by erosion. Tinea versicolor is distinguished from erythrasma with greater difficulty; but the latter occurs in different situations by preference, its patches are more vividly tinted, and the parasite, under the microscope, presents distinctive features.

Treatment is that of tinea versicolor.

Prognosis is favorable, subject to the disappointments arising from frequent relapses.

¹ Cf. Annales, 1891, s. iii., ii., p. 776.

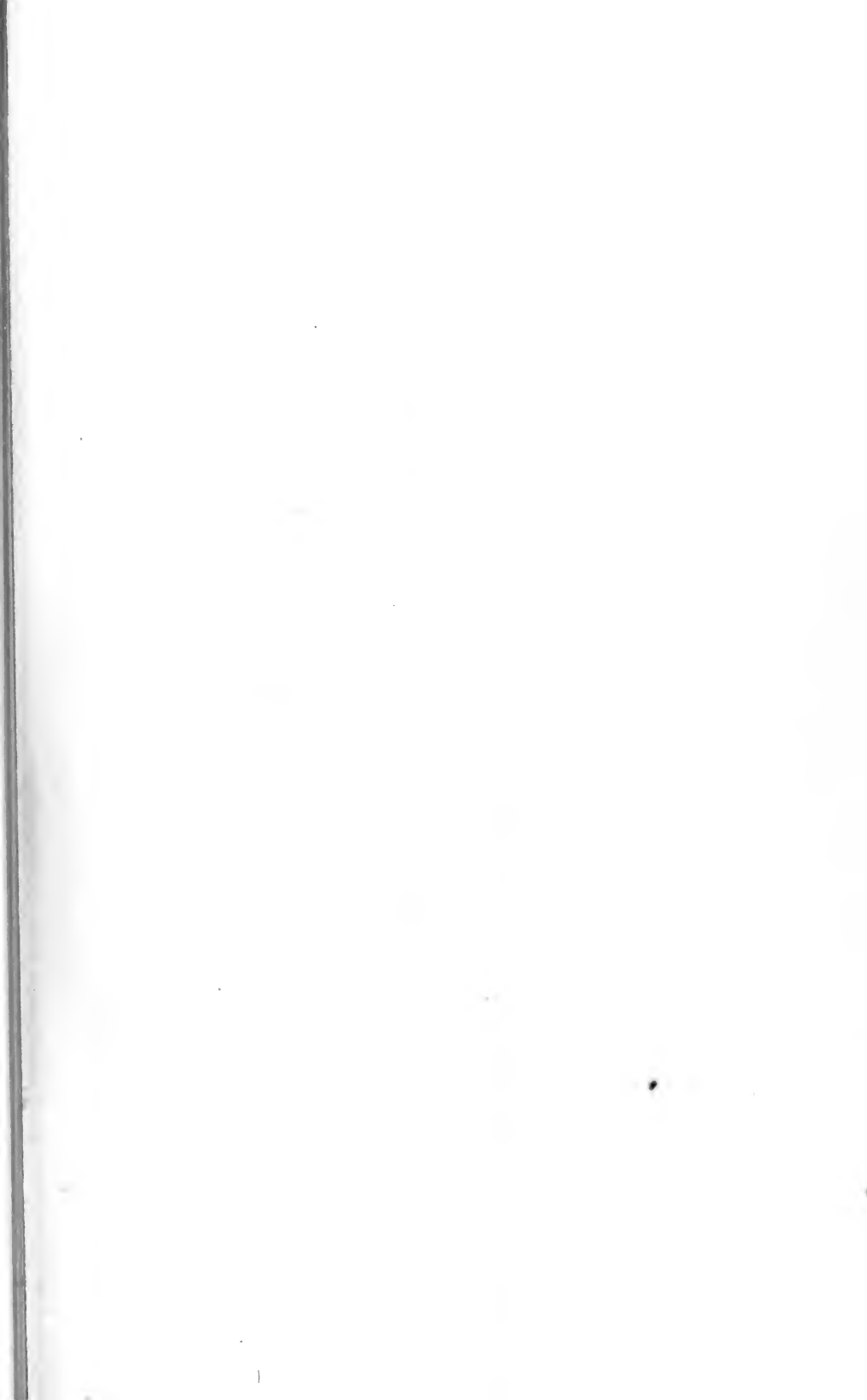


PLATE XLVIII



Blastomycosis.
(From a photograph.)

BLASTOMYCOSIS.¹

(BLASTOMYCETIC DERMATITIS, SACCHAROMYCOSIS HOMINIS, DERMATITIS BLASTOMYCOTICA. *Ger.*, HEFENMYKOSE.)

Cutaneous blastomycosis is a chronic, inflammatory, infectious disease, characterized by the appearance upon the skin of a small papule or papulo-pustule, which becomes crusted and extends peripherally to form a sharply outlined, elevated, verrucous patch situated upon a pus-infiltrated base and presenting a characteristic, abruptly sloping border in which are seen minute, deeply seated abscesses. Blastomycetes are found in the sero-purulent contents of the abscesses, from which both budding and mycelial forms of organism have been obtained in pure culture.

The invasion of the bodies of animals by blastomycetes had been studied before the disorder was recognized in the human family. In 1894 Busse published an account of a fatal case of pyæmia, with subcutaneous abscesses and cutaneous manifestations, in which the pathogenic agent was a yeast. A few months earlier, Gilchrist had demonstrated before the American Dermatological Association microscopic sections containing budding organisms from a lesion which Duhring considered a scrofuloderm. Later communications from Busse and Buschke and from Gilchrist and Stokes have been followed by reports from a number of observers, including Curtis, Wells, Hessler, Anthony, Brayton, Stelwagon, Dyer, Shepherd, and ourselves. The records of nearly one hundred cases published or unpublished, in which the nature of the disease has been demonstrated satisfac-

¹ For a more detailed review of the clinical, histological, and bacteriological features of cutaneous blastomycosis, with 16 clinical and 25 histological and bacteriological illustrations, a brief summary of 13 of our own cases, and bibliography, see report, *Jour. Amer. Med. Assoc.*, 1902, i., p. 1486. For a full consideration of experimental work, and animal inoculations with blastomycetes, see Buschke's complete monograph, *Bibliotheca Medica*, D. II. H. 10, 1902 (illustrations and bibliography); and monograph: "De la Blastomycose humaine," by Harter, Nancy, 1909. For valuable contributions and full references to researches on blastomycetes, protozoa, cancer bodies, and cell inclusions, see the Second Annual Report of the Cancer Committee to the Surgical Department of Harvard Medical School, *Jour. Med. Resch.*, 1902, vii., No. 3.

Recent cases: Gilchrist, a case in a negro, with illustrations, review, and bibliography, *Brit. Med. Jour.*, 1902, ii., p. 1321. Sheldon, report of a case, *Jour. Amer. Med. Assoc.*, 1902, ii., p. 1356. F. H. Montgomery, a case of cutaneous blastomycosis followed by systemic tuberculosis, *J. C. D.*, 1903, xxi., p. 19. Ormsby and Miller, a systemic case with multiple cutaneous and subcutaneous lesions, a full report with illustrations. Sequeira, report of a case, *B. J. D.*, 1903, xv., p. 121. Evans, "A Case of Cutaneous Blastomycosis from Accidental Inoculation," *Jour. Amer. Med. Assoc.*, 1903, p. 1772. Pusey, two cases presented to the Chicago Derm. Soc., *J. C. D.*, 1903, xxi., p. 223. Fischkin, report of a case, *Ill. Med. Jour.*, 1903, v., p. 472. Gilchrist, three cases, with four clinical illustrations, and abstract of McCarrison's report of a case which occurred in a native of Northern India. *J. C. D.*, 1904, xxii., p. 107. Montgomery and Ormsby, *Archives of Internal Medicine*, August, 1908, "Systemic Blastomycosis—Its Etiologic, Pathologic, and Clinical Features as established by a Critical Survey and Summary of Twenty-two cases, seven previously unpublished; the Relation of Blastomycosis to Coccidioidal Granuloma." In this review the authors give an abstract of twenty-two established and five probable cases of systemic blastomycosis. For a review of the entire subject the reader is referred to the original article.

torily, are now available. The following description is based chiefly on the clinical, pathological, and bacteriological study of a large number of cases of both cutaneous and systemic blastomycosis.

Symptoms.—The disorder in the skin begins as a papule or papulo-pustule, which soon becomes covered with a crust. The lesion slowly enlarges peripherally in the form of an indolent, flat, wart-like or crusted papule. In the majority of all cases the lesions had existed a number of months and had attained a diameter of an inch or more before the patient applied for treatment. We have had the opportunity once of watching a lesion grow from the initial small papule.

In lesions that have attained the diameter of half an inch or more, the following characteristics are apparent: The patch is elevated from one-eighth to three-eighths of an inch above the surrounding skin; the surface is covered by irregular papilliform elevations, separated by clefts or fissures of varying depth, giving it a verrucous or cauliflower appearance. In the younger and near the border of the older lesions, especially of those which have been kept clean, the papillary projections are fine and the surface is fairly firm, dry, and wart-like. Portions of larger areas, and especially of those which have been untreated, are covered by more or less bulky and adherent crusts, on removal of which the papillary elevations are seen to be larger, lobulated, even subdivided, and bathed with a sero-purulent secretion. Some of these crust-covered projections are very vascular, a slight touch causing them to bleed. In exceptional instances the area under a crust may present the appearance of an ordinary unhealthy ulcer, with exuberant granulations. In older lesions, the papillomatous surface may be replaced in part with a thick, elevated, scar-like formation, pinkish-white in color, irregular and often corded, but having a smooth, shining surface. The base of the active lesion is always soft and more or less infiltrated with sero-pus, which, on slight pressure, oozes between the papular elevations.

The border of the area is one of the most characteristic features. It slopes more or less abruptly from the elevated roughened surface to the normal skin, from which it is sharply defined. It is smooth, of a dark red or purplish-red color, is from one-eighth to three-eighths of an inch wide, and on close inspection is seen to be beset with a large number of minute abscesses. Many of these abscesses are so small that they are not visible to the naked eye, but can be recognized with a lens magnifying from two to six diameters. Others vary in size up to that of a pinhead. Some are superficial, but many, especially the smaller ones, are deep-seated. When carefully punctured with a fine needle, these abscesses give exit to a small amount of thick, glairy mucus or muco-pus, the purulent character of the secretion increasing with the size of the pustule. From the smallest abscesses the amount of mucus expressed is sometimes so scanty that it can only be seen with the aid of a lens, yet it is from these minute abscesses that the organisms are best obtained in pure culture. Abscesses of the same sort occur also in other parts of the growth, and not infrequently

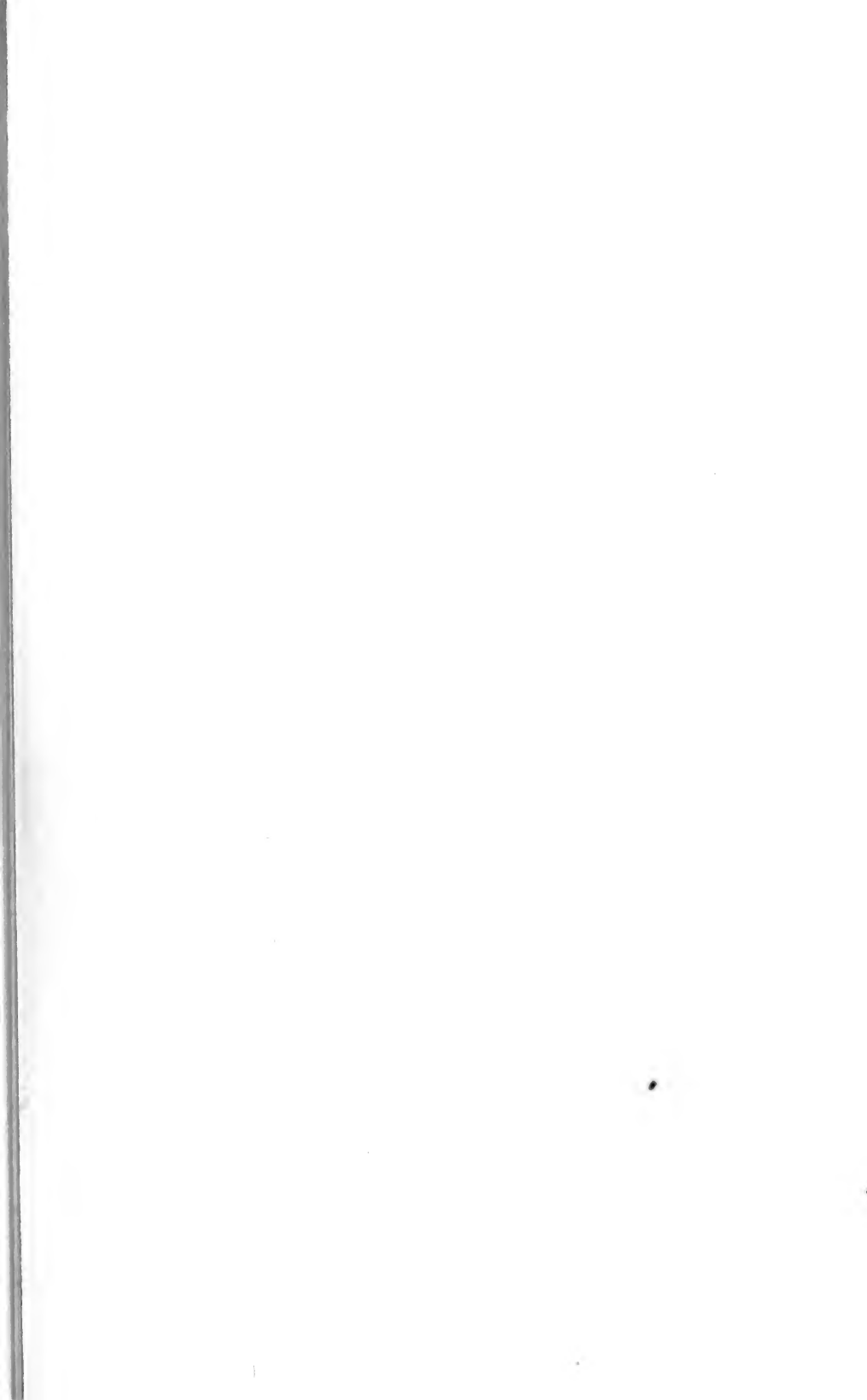
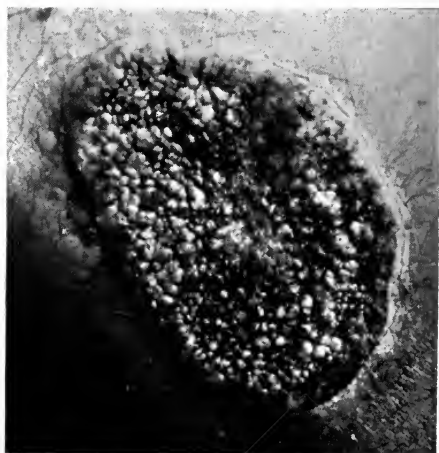


PLATE XLIX



Clinical Types of Cutaneous Blastomycosis.

on the thick, scar-like tissue described above, but in characteristic development they are best seen on the sloping border. The number of abscesses varies in different cases and in the same case at different times, depending somewhat upon the activity of the process.

The cutaneous lesions found in the systemic cases only occasionally correspond to the above description. They are found chiefly in the form of irregular, ragged, rather superficial ulcers, having a soft base, a granulating floor, and a purulent or sanguineo-purulent discharge which often forms bulky crusts. These ulcers are usually preceded by subcutaneous abscesses which gradually or rapidly extend to the surface and rupture externally. These subcutaneous nodules and abscesses are characteristic of the systemic cases and often occur in successive crops.¹

The course of the disease is irregular but essentially chronic. Usually months elapse before the original patch attains a diameter of an inch or more. It may remain indolent for months or even years, with irregular periods of activity and progress, but, as a rule extension of the area is slow and continuous. In about half the cases the original patch of the disease has been followed in the course of weeks or months by one or more new lesions in adjacent or other regions of the body. In some instances the clinical evidence of auto-infection has been very strong. The majority of the areas sooner or later attain the size of a silver dollar or of the palm, and some of them become much larger. As the disease ends at the periphery, healing frequently occurs in the central portion of the growth. In this manner large areas (in Anthony and Herzog's patient the greater portion of the thigh and leg) may be involved in various stages of the process. Healing sometimes occurs spontaneously. Whether spontaneously or as the result of treatment, the first indication of healing is found in the gradual flattening and disappearance of the papillary projections, partly by absorption, partly by desiccation and exfoliation. At the same time the amount of secretion from the underlying base diminishes, and the whole patch assumes more of an ordinary verrucous appearance. In many instances the papilliform surface is replaced temporarily by the hypertrophic scar-like tissue described above, which in turn gradually disappears and gives place to the characteristic cicatrix, which eventually becomes soft, supple, non-attached, pinkish-white, and, on the whole, very inconspicuous, though always sharply outlined from the surrounding skin. As a rule, the resulting deformity is very slight. In some instances where destructive agents or scraping operations have been employed, the disappearance of the characteristic lesion is followed by an ordinary indolent ulcer, which heals with a thickened and somewhat deforming scar.

During the healing process, though the miliary abscesses decrease in number, careful search will reveal them even in scar-tissue that has become quite thin and soft. It is consequently not uncommon to see

¹ Archives of Internal Medicine, August, 1908.

areas that apparently have healed, become more or less covered again with active points or areas of disease. A single patch may thus present nearly all stages of the disorder, showing at the same time several of the following features: the advancing border; new-forming lesions on old scars; verrucous or cauliflower lesions in various stages of development or disappearance; a base in places dry and firm and in others soft and infiltrated with muco-pus; a scar-tissue, in part thick and irregular and in part smooth, soft, supple, and non-attached to the deeper tissues.

The regions involved are usually those most accessible to local infection, the disease occurring with greatest frequency on the face, hands, wrists, or forearms; but no portion of the body is exempt. The eyelids are a frequent seat of the disease, but the conjunctiva escapes, though ectropion resulting from destruction of the lid causes conjunctivitis and keratitis, due to exposure. Adenopathy has been noted in systemic cases only, though pus infection of lesions may be followed by a transitory involvement of adjacent glands.

The subjective sensations of the disease vary greatly. As a rule pain is slight or absent except in areas which are acutely inflamed as a result of secondary infection.

The majority of patients have been in good general health, though some have suffered from other systemic disorders, which evidently bore no definite relation to the blastomycosis. Of the entire number, one patient only died of generalized tuberculosis. In nineteen cases death occurred from systemic infection with blastomycetes, the organisms being demonstrated at the autopsy in the viscera, and in three cases in the blood. One of the nineteen patients¹ remained in vigorous health for seven years after the appearance of cutaneous lesions and then rapidly developed grave constitutional symptoms.²

Etiology.—A local infection with the fungus peculiar to each case is the sole recognized cause of the disease. In one instance a slight wound of the finger incurred at the autopsy of a case of systemic blastomycosis was followed in one week by the appearance at the site of the injury of a pustule which refused to heal and later developed into a typical cutaneous lesion in which budding organisms were demonstrated repeatedly. The infectious character of the disorder is demonstrated further by successful inoculation of animals. In several instances there has been a history of trauma preceding infection. What other conditions favor the origin and development of the process have not been determined. Why certain yeasts and mould fungi are pathogenic, while others are innocuous, how common in nature the pathogenic varieties are, and how they differ from the ordinary varieties, are unsolved problems.

No relation has been discovered between the disease and the sex, occupation, nativity, or habits of the individual affected. The fact that the majority of cases occur in men is due probably to their more

¹ Montgomery-Walker case.

² Archives of Internal Medicine, August, 1908. Discussion of clinical symptoms exhibited in systemic cases.

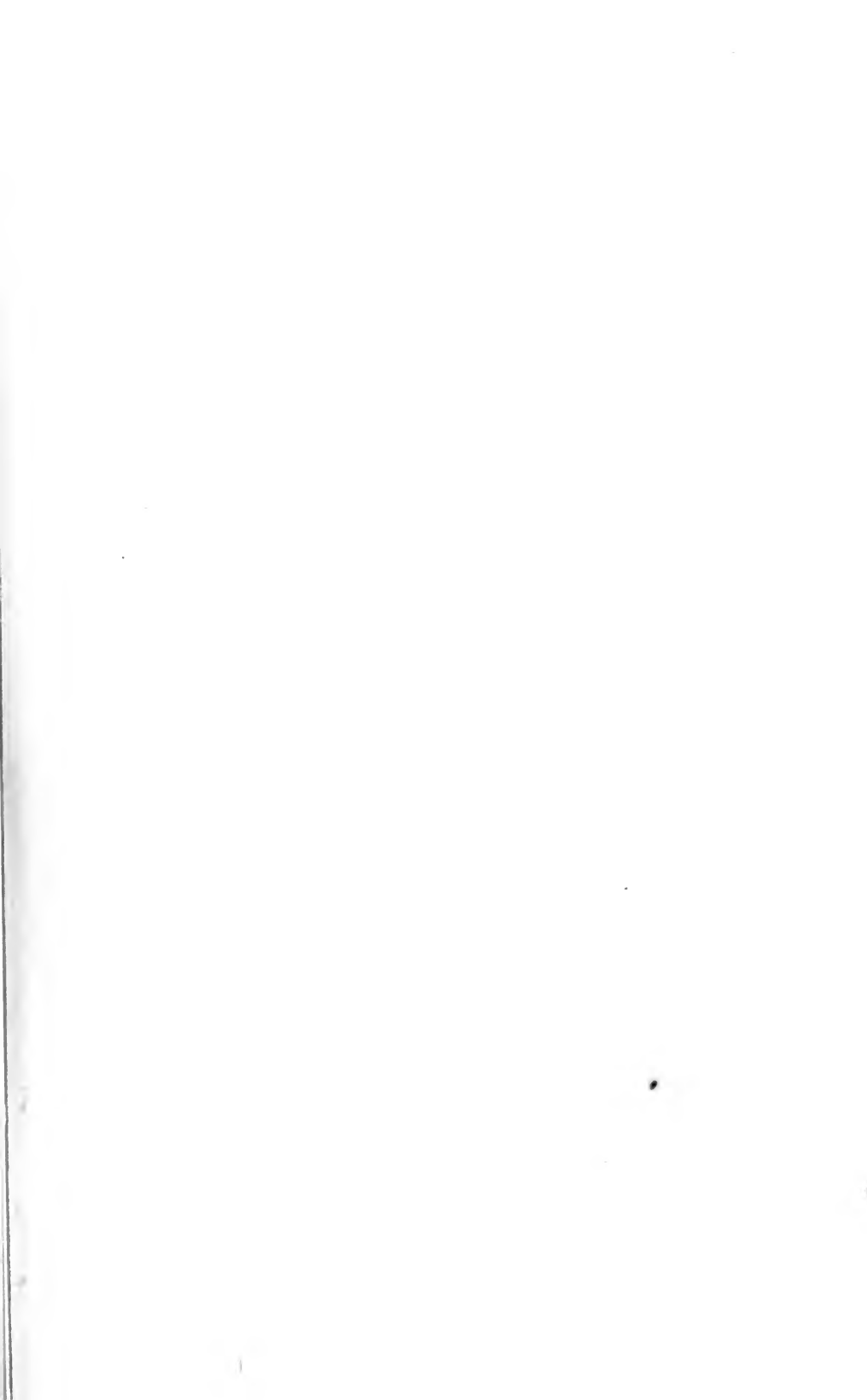
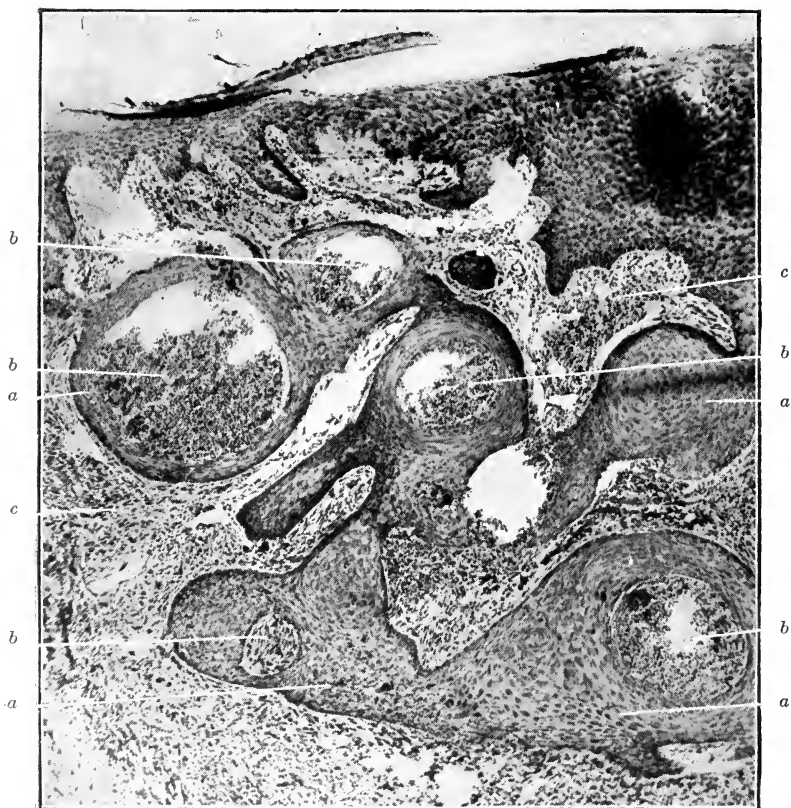


PLATE L

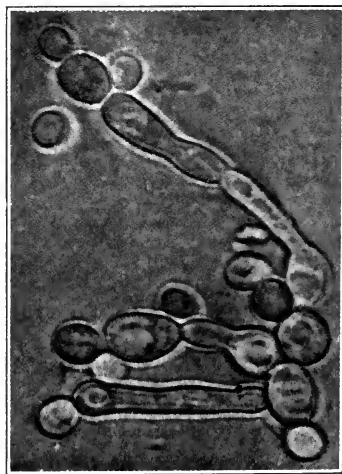


Vertical Section from a Typical Lesion.

a, hyperplasia of rete; *b*, abscesses in epithelium; *c*, infiltration of cutis. $\times 55$.



Budding Organism in Tissue. $\times 1200$.



Hanging Drop. $\times 1200$.

BLASTOMYCOSIS OF THE SKIN.

(From a photomicrograph.)

frequent exposure to infection. About half the cases have occurred after the age of forty with the majority of the remainder between twenty and forty. Recently it has been observed in younger subjects, the youngest¹ being 8 months old at the time the nature of the disease was established. No definite relations between blastomycosis and other local or systemic disease has been demonstrated. The possibility of blastomycotic infection being secondary to lesions of other disorders or to trauma is admitted; it is equally possible for the lesions of blastomycosis to be infected secondarily with tuberculosis or other disease.

Pathology.—Histologically the lesions resemble those of verrucous tuberculosis or of superficial epithelioma, yet differ from both. The surface on which are seen irregular masses of debris consisting of pus, blood- and epithelial cells, and various bacteria, is marked by irregular papilliform projections, between which are corresponding depressions. The horny layer may be destroyed or it may extend in thickened masses between distorted papillae.

The rete is everywhere the seat of excessive hyperplasia, producing branching down-growths varying greatly in size and shape. Polymorphonuclear leucocytes are scattered throughout the epithelium, both between and within the cells, and occur often in small collections which are the beginning of miliary abscesses. These abscesses are characteristic of the process, and are found in all parts of the hyperplastic epithelium, in places breaking through to the surface. They contain leucocytes, nuclear fragments, detached epithelial cells, epithelial detritus, red blood-corpuscles, the organisms peculiar to the disease, and in many cases giant-cells. The epithelial cells surrounding the abscesses are flattened, but appear to take no active part in the process. The epithelium is separated from the corium in most places by a distinct layer of columnar cells, in which mitoses are seen occasionally. The rete-cells in general are large and appear swollen, the prickles being very conspicuous and the intercellular spaces increased. Premature cornification, more or less complete, occurs in scattered individual cells, in groups of cells, and occasionally in isolated epithelial whorls. Single giant-cells, surrounded by a few leucocytes, are sometimes seen in the epithelium at some distance from the corium.

The corium is the seat of subacute, chronic, and occasionally of acute inflammatory changes. Miliary abscesses occur, especially in acute lesions. The infiltration consists chiefly of leucocytes, endothelial cells, and plasma-cells, and is sometimes very dense. The number of mast-cells and giant-cells varies in different cases. Tubercle-like nodules are found in some instances. In several cases sections showed numerous hyalin bodies which varied greatly in size, and occurred chiefly in plasma-, giant-, and new connective-tissue cells.

The appendages of the skin apparently play but a passive part in the process.

¹ Kessler, J. B., Jour. Amer. Med. Assoc., 1907, xlix., pp. 550-552.

The blastomycetes are found in miliary abscesses, between the epithelial cells and in the corium, and are always surrounded by more or less evidence of inflammation. They are rarely found within the cells. The giant-cells, however, usually contain one or more of the parasites. The number present in the tissue varies greatly. In some cases a dozen or more can be seen in a single field of the microscope, while in others they are found with difficulty. They occur usually in pairs of unequal size, but also singly and in groups. They are readily seen in sections stained with hæmatoxylin and eosin or other common stains, but methylene-blue is best for showing the different parts of the organism. The fungus is easily demonstrated by placing fresh or hardened sections, or pus, in a strong solution of potassium hydroxide, or in equal parts of liquor potassæ and glycerin; the organisms then appear as doubly contoured, highly refractive bodies.

When well stained, the parasite is seen to be a round, oval, or slightly irregular body, having a well-defined, double-contoured, homogeneous capsule, and a finely or coarsely granular protoplasm, which is separated from the capsule by a clear space of varying width. The capsule resists the prolonged action of strong alkalis and acids. The protoplasm often contains a clear vacuole, which varies greatly in size in different bodies. Mature organisms have a diameter of from 7 to 20 μ , though smaller and larger forms are seen occasionally.

Budding forms are seen in all stages of development; the capsules and clear space are pushed out apparently by the protoplasm to form oval buds, which grow to about one-half the size of the mother-cell before separating from the latter. Organisms in pairs of unequal size are more common than budding forms.

Mycelium has not been demonstrated in tissue or in the contents of the abscesses. In two cases organisms in the tissues were filled with small globular bodies which reacted to stains like spores but no further development of these bodies could be seen.¹

In a systemic case, Ormsby excised a small-bean-sized subcutaneous node, in which the epidermis was normal and the corium but slightly involved, the process being manifested chiefly in the subcutaneous tissue. The zones of infiltration were for the most part fairly well defined about dilated blood-vessels. The infiltration consisted of large numbers of the organism, also leucocytes, erythrocytes, connective-tissue, plasma-, mast-, and giant-cells in varying numbers. In places there was a suggestion of tubercle formation, in that the organisms, leucocytes, and red-blood cells were found chiefly in the centre of the node and surrounded by giant-, connective-tissue, and plasma-cells. In this and other systemic cases the organisms were very numerous and larger than those found in most of the cutaneous cases.

The organism is obtained easily in pure culture from the minute deep-seated abscesses in the borders of the cutaneous lesions. Cultures taken from the larger abscesses and from teased tissue are con-

¹ In a single case we found in the larger abscesses a few pod-like bodies, and fragments of a thick mycelium containing what appeared to be spores.

taminated often with pus-cocci or other bacteria. The blastomycetes have been obtained repeatedly, however, in pure culture from pus-abscesses of considerable size, showing that the organisms are in themselves pus-producing. In cultural features the organisms from different cases have varied considerably, and it is possible that they will have to be classed in distinct botanic groups. On the other hand, individual organisms have been shown to vary greatly with the media employed and with other circumstances of culture, and the different types seen may be various stages of development of a single variety of fungus.¹ The organisms grow rapidly on most ordinary media, and though by varying the media and other circumstances of growth a given organism can be made to assume a variety of appearances, in most instances the type is that of a mould fungus, showing on agar or glucose agar a white, fluffy growth with aërial hyphæ, and on glycerin agar a pasty growth with numerous folds and depressions.

Under the microscope, cultures show budding organisms and mycelium, that may be fine, homogeneous, and branching, or coarser, more or less segmented, with or without lateral conidia. The mycelium may contain few or many highly refractive bodies, varying in size, which probably are spores. Mingled with the mycelium of older cultures are round, oval or irregular, double-contoured bodies, varying greatly in size and more or less filled with highly refractive, globular bodies. These globular bodies, like those seen in the coarser mycelium, behave in every way toward reagents like spores, but in no case have they been observed to develop into mature organisms.² Young colonies and cultures on glucose agar are made up of fine mycelium, with or without the presence of budding organisms. Older cultures and those on glycerine agar show much coarser mycelium and a preponderance of the circular spore-containing bodies. A bit of old culture made up entirely of these round bodies, placed in a hanging drop of bouillon, develops in two or three days an abundant fine mycelium, in which the spore-like bodies are disseminated.

Though in tissues and in the abscesses the organism develops by budding only, fresh cultures from the abscesses show fine mycelium more frequently than budding forms. Animals inoculated with cultures composed of mycelium have developed abscesses from which budding forms only were obtained.

Inoculation-tests have been largely unsuccessful, but in several instances subcutaneous injection of pure cultures of the blastomycetes has resulted in the production of a local abscess, or of an inflammatory granulation-tissue, from which the fungus could be recovered. Intraperitoneal injections were unusually successful with the organism from a systemic case reported by Montgomery.³ By inoculating the skin of animals with pure cultures of blastomycetes, Buschke succeeded in producing tumors which resembled closely the lesions of

¹ Hamburger, Jour. Infect. Dis., 1907, iv., p. 201.

² Under certain conditions blastomycetes may develop by sporulation.

³ J. C. D., 1907, xxv., p. 393.

cutaneous blastomycosis in man. The organisms in several cases have been inoculated in animals with the production of tubercular-like nodules, or other inflammatory areas, in the lungs, kidneys, and other organs, from which the fungus has been recovered and cultivated.

Diagnosis.—Though many of the cutaneous lesions of blastomycosis resemble verrucous tuberculosis so closely that a definite diagnosis can be established only after a microscopic examination of the tissue or of the contents of minute abscesses, lesions showing the typical border set with abscesses described above are so characteristic and are present so frequently that a positive clinical diagnosis is possible in most cases.

The readiest means of confirming the diagnosis is to place the contents of one or more of the abscesses, or a bit of teased tissue, between a slide and cover-glass with a drop of a 20 or 30 per cent. solution of potassium hydrate. If distinct budding organisms are found, which resist the action of the alkali after the tissue and pus-cells have largely disintegrated (a change requiring from ten minutes to one hour), the diagnosis is practically established, but should be verified further by obtaining cultures of the organism and by histological examination of the tissue.

Other disorders to be excluded by a consideration of their characteristic features are lupus vulgaris and other tuberculoses of the skin, the rare vegetating forms of syphilis, and protozoan infection, which, it is now believed, may be a variant of blastomycosis.

Treatment.—Complete excision of the diseased areas has been practised successfully in several cases, no recurrence having been reported. Curetting, employed in a number of instances, has not prevented a return of the disease.

Large doses of potassium iodide, first employed by Bevan with one of our patients, arrests the progress of the disease and produces a marked improvement in the cutaneous lesions. From two to five hundred grains a day have been required in some patients before any effect on the morbid growth was produced. In three of our cases and in several reported by others the disease disappeared under this treatment. In the majority of patients, however, treated with large doses of potassium iodide, healing takes place rapidly over the greater portion of the area involved, but small patches remain, usually of the verrucous border, for indefinite periods; and on the discontinuance of the potassium iodide the disease reappears with as great activity as before. In three of our patients who improved rapidly under the treatment up to a given point, the few remaining verrucous areas and abscesses disappeared after a few exposures to the *x*-rays. Pusey, Fischkin, and others have had good results from the combined use of potassium iodide and the *x*-rays.

More recently Bevan¹ recommended copper sulphate in one quarter grain (.016) doses internally with a one per cent. solution of the same as a local wet dressing.

¹ Jour. Am. Med. Assoc., 1905, Nov. 11.

For most lesions, cleansing and antiseptic lotions or dry dressings can be used with advantage.

Prognosis.—Complete excision when practised has terminated the disease. Under the iodine therapy, the condition improves so decidedly that with the aid of the x-rays, or other local treatment, the disease should be eradicated completely. Recurrences, however, are common, even after the last clinical evidence except scars has been removed.

The prognosis in systemic cases is grave as in 19 out of 22 patients the disease proved fatal.

PROTOZOIC AND COCCIDIOIDAL INFECTIONS.

Protozoic and coccidioidal¹ infections of the skin have been reported by Wernicke, Rixford and Gilchrist,² Posadas, D. W. Montgomery,³ and Ophüls and Moffit, in which the cutaneous manifestations both clinically and histologically, resemble very closely those of cutaneous blastomycosis. In the general symptoms, in the formation of subcutaneous abscesses, in the fatal termination, and in the larger size and greater number of organisms in the lesions, these cases correspond closely with those of systemic blastomycosis, with which they undoubtedly are allied closely if not identical. In cases of coccidioidal infection the organism develops by endogenous spore-formation and never by budding; while in blastomycosis the only method of development of the organism in tissue is by budding. Though in at least two cases of the latter disease the organisms have contained what undoubtedly were endogenous spores, the development of these spores into mature bodies could not be demonstrated. The cultures obtained from cases of coccidioidal infection differ slightly from those obtained repeatedly in blastomycosis. It is possible that the difference between the organisms in blastomycosis and in coccidioidal disease may be due to the influence of climate, all reported cases of coccidioidal disease having originated in warm countries.

SPOROTRICHOSIS.⁴

In 1898 Schenck⁵ reported the findings in a patient who developed multiple subcutaneous abscesses along the course of the lymphatics up the arm starting from a wound of the finger. The abscesses when opened contained a gelatinous or aqueous fluid and from this a sporothrix was isolated. In 1900 Hektoen⁶ and Perkins reported a similar

¹For comparison between coccidioidal granuloma and systemic blastomycosis see Archives of Internal Med., August, 1908.

²Johns Hopkins Hospital Reports, i., 1896 (a full report of two cases and of the organisms, with illustrations).

³B. J. D., 1900, xii., p. 343 (bibliography), and J. C. D., 1903, xxi., p. 5 (a new case).

⁴Mewborn, A. D., J. C. D., 1908, xxvi., pp. 140-143; gives an excellent review of recorded cases with full bibliography.

⁵Johns Hopkins Hospital Bull., 1898, p. 286.

⁶Journ. Exper. Med., 1900, p. 77.

case as to clinical symptoms and bacteriological findings. In 1899 Brayton¹ made a clinical report of an apparently similar case. In 1903 De Beurmann² and Ramond described a case from which the same parasite was cultivated. There are now many cases on record.

The most characteristic lesions of the infection are the subcutaneous nodules and abscesses, though cutaneous and visceral lesions have occurred; ulcers in the skin which are described as resembling verrucous tuberculosis have formed. Fistulous openings connecting with deeper abscesses occur with local superficial cutaneous lesions about their edges. The course of the disease untreated is chronic.

Histopathology.—The histopathology of the infection has been thoroughly studied and found to resemble those disorders classed as the infectious granulomata. Blastomycosis, tuberculosis, syphilis, and deep-seated coccogenous infections are all simulated.

The organism is obtained in pure culture from the abscesses in six to eight days after inoculation and appears first in round white colonies. These later spread, become wrinkled, and dark colored. The media for growing trichophyta are suggested by Sabouraud for this parasite. It also grows in bouillon in which it may form a veil or flocculent down-growth. Microscopically, it occurs as a fine mycelium with long partitions; oval spores develop a terminal filament which is capped by several spores.

Diagnosis.—The parasite is apparently difficult to find in fresh specimens differing considerably in this respect from blastomycosis, a disease it closely resembles in many particulars. The positive proof lies in the cultural findings.

Treatment.—Potassium iodide appears specific in its management. Surgical intervention may be indicated in large abscesses.

Prognosis.—The prognosis in the disease when recognized is good.

DISEASES DUE TO ANIMAL PARASITES.

The human skin may be attacked by animal parasites which (*a*) habitually exist upon or within the integument, securing their nutriment in these situations; (*b*) exist upon the clothing, furniture, or other articles of environment of the body, attacking the latter only when in search of food: (*c*) are brought accidentally into contact with the human body and attack it when irritated or alarmed without seeking nutriment; or (*d*) infest the vascular channels or viscera of the body and involve the skin only when approaching the surface as an accident of the human invasion.

Some parasites are sexually mature; others only in the larval condition. Few of the entire list confine their attacks to the human body, the most afflicting other animals as well as man.³

¹ Ind. Med. Journ., 1899, p. 272.

² Annales, 1903, s. iv., iv., p. 678.

³ Braun, M., Animal Parasites. New York, 1906.

SCABIES.

(Lat., *scabere*, to scratch.)("THE ITCH." *Fr.*, GALE; *Ger.*, KRÄTZE.

PARASITE: SARCOPTES SCABIEI, ACARUS SCABIEI.)

Scabies is a contagious cutaneous affection in which multiform lesions (papules, vesicles, pustules, excoriations, crusts) occur upon the axillary folds, the hands (especially the interdigital spaces), the wrists, the abdomen, the upper thighs, and in infants often also the face and feet, characterized by intense pruritus with nocturnal aggravation, and due to the presence of *Acarus scabiei*.

Symptoms.—Scabies is a disease of polymorphic symptoms, which may be viewed as an artificial eczema or dermatitis, produced by the invasion of the itch-mite (Fig. 168). The objective symptoms differ according to the extent to which the skin is primarily invaded by the parasite, or is secondarily injured by traumatism and severe scratching of its surface.

Prominent among the objective symptoms is the cuniculus, or acar-ian furrow, an elongated gallery excavated in the epidermis by the female acarus soon after her impregnation by the male. The male does not enter the skin, but is lodged beneath the crusts or other exuviae which gather upon its surface. This cuniculus, or furrow, is a whitish or a yellowish, slightly arciform, linear lesion, with regular parallel borders covered with dots or specks of blackish aspect, representing faeces of the mite. The furrow (Fig. 169) terminates at the upper extremity by a vesicle, pustule, or exfoliation of the surface at the site of an infundibuliform depression; and at the deeper extremity by a whitish and yellowish, shining and salient point, representing always the *acarus*. This is the most characteristic symptom of scabies.

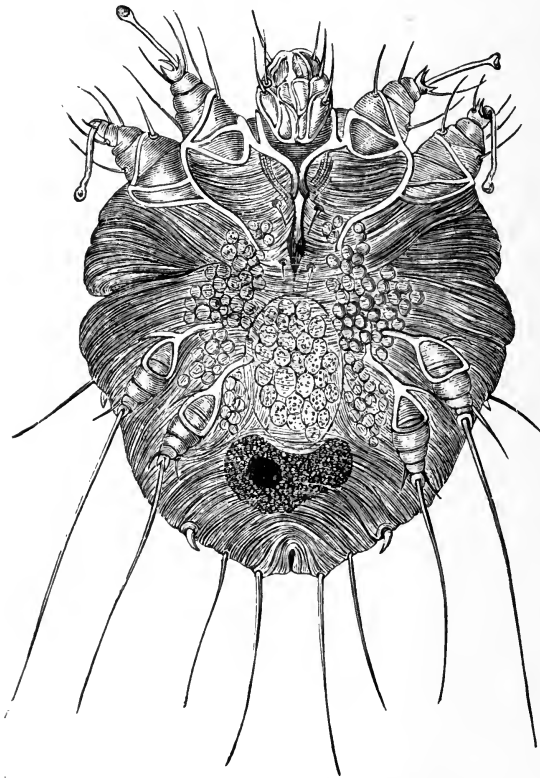
The "head" of the gallery, where the parasite first entered the skin, is usually whitish, and is more elevated than the "tail," where the acarus rests after laying its dozen or more of eggs. At times the entire cuniculus forms an elevated ridge, rather than a thread-like depression, with white dots along its summit. When the roof of the vesicle at "the head" is torn off by scratching the effect is to produce a reddened spot at its site, surrounded by a whitish moat running around the entrance of the gallery.

When the burrow exists it can be recognized most perfectly in the interdigital spaces and on the skin of the penis as a tangential line, running from a vesicle, papule, or pustule to a distance of from one-eighth of an inch to an inch. It resembles a beaded, dotted, yellowish or blackish thread, the color being more pronounced in comparison with a fresh-colored and washed skin, and less marked in contrast with a soiled surface; being, in a soiled and subsequently washed integument, most conspicuous in proportion as the small puncta have served to entrap particles of dirt. The cuniculus may be curved, angular, or tortuous; and occasionally may be seen well-nigh completely covered by a bulla, pustule, or vesicle extending its entire length. In

these cases, however, the female always penetrates beyond the peripheral wall of such lesion, working her gallery beyond it and more deeply, lest she be lifted by the exudation out of reach of the succulent rete where she feeds.

Hebra points to the fact that between two parallels, one drawn through the nipples and another at a short distance above the knees,

FIG. 168.



Female acarus fecundated (ventral surface). An ovum arrived at maturity is visible within the body. (After KAPOSI.)

on the anterior face of the body, can be recognized the greater part of the eruptive lesions in every case of scabies.

The disease is indeed one peculiar to those classes which are the familiars of filth and poverty, occurring among these at all ages and in both sexes. As a matter of accident, it may appear, though rarely, in individuals of high social station. It is much more common in Scotland, Austria, Prussia, Sweden, Norway, France, and the Orient, than in America. During the late Civil War it prevailed with relative frequency among the masses of Americans associated in regiments with foreigners who had been but a short time in the country; and steadily decreased after that time. But few cases until lately were

seen annually in the public clinics of our large cities, though here and there, chiefly among newly arrived immigrants, isolated groups of cases of the disease were discovered. The influx of immigrants to the United States, however, in the last few years, has brought the disease again into prominence by reason of its greatly increased frequency.¹

In consequence of the irritation produced by the parasite and the traumatism by scratching, the region invaded may exhibit all the symptoms of acute and chronic dermatitis including vesicles, pustules, wheals, small papules, hyperæmia of the skin upon which these rest; crusts formed by dried serum, pus, and blood; excoriations, fissures, and, in cases of long standing, pigmentation of the skin where the disease has existed. These lesions may coexist, several appearing at the same time upon the skin of an affected individual; small vesicles and pustules, with perhaps a few short cuniculi visible upon their summits; excoriations; larger and longer cuniculi interspersed between inflammatory papules; a tumid skin, evidently the seat of a mild grade of dermatitis; and crusts here and there, beneath which male and young acari are ensconced—such is the composite picture of a typical eruption in scabies.

It will be remembered that the acarus family find nutriment, shel-

FIG. 169.



Acarian furrow, from the lumbar region. The female acarus is visible at the terminal extremity of the furrow with ventral surface exposed, and containing a mature ovum; two ova, next her, have been laid during the day; the third exhibits traces of the embryo; the twelfth exhibits a mature larva (*a*); twelve empty shells are also seen; between these the feces are represented by black points. (After KAPOSI.)

¹*Cf.* Hyde, Scabies in the United States and Canada, Amer. Jour. Med. Sci., Mar., 1905.

ter, and all they require on the person of the individual whose skin they inhabit, and there is no inducement for them to colonize at the instant of the first opportunity offered. The transfer of a male acarus alone, from one person to another, would not insure a generation of the young; and the unimpregnated female could not alone do more. As for the impregnated female, Hebra, on several occasions, failed to induce scabies when one such female only was transferred intentionally to a sound skin and was seen to penetrate it. Lastly, the eggs alone would not suffice, for they have to be nicely planted within the epidermis in order to be hatched safely to maturity. In brief, only the more intimate contacts of the bed at night, and the application of nails charged with acari of both sexes, especially the young, are to be regarded as most effective for the transmission of the disease. This fact explains why nearly seven men are found to be affected with scabies to one woman. Women, as a rule, are more inclined to sleep alone, or with those only to whom they have family ties; while laborers, boys, apprentices, and persons of that class, including those who are strangers to each other, at times occupy the same beds, especially in large cities, where they are often huddled together at night like swine.

The female acarus may be recognized always at the terminal extremity of her gallery, for it is now known that she does not in her lifetime leave it for any purpose, as was at one time taught. The intruder here shows as a minute, whitish, clearly defined dot, presenting a contrast in this particular with the blackish feces in the gallery behind, and may in a good light, by a person of some dexterity and fair eyesight, be extracted on the point of a cambric needle from her lodging-point. It is important to know that this parasite may be recognized by the unaided human eye. Its characteristic tortoise-like body exhibits most of its anatomical peculiarities under a glass enlarging the figure but one hundred diameters.

The regions affected by the eruption are the sides and roots of the fingers and toes; the flexor aspects of the wrist-joints; the feet (and especially in women, the delicate skin of the feet near the instep, partly dorsal, partly plantar in situation); the palms (especially of women and children) and the dorsal surfaces of the hands; the buttocks (more particularly in those who are seated in the trades and occupations of life); the extensor faces of the joints; the belly; the penis and scrotum in men; the anterior folds of the axillæ; the nipples and breasts of women; the elbows and knees, rather than the popliteal space and bend of the elbow; and the anal region. Scabies, prurigo, and pruritus are alike in this, that in each the face and posterior aspect of the body display the fewest of any lesions visible. In general, portions of the body subjected to constant pressure by the clothing, as, for example, the regions pressed by the corset of the woman and the waistband of the trousers in man, are sites of predilection. In other cases the disease is encountered in the axillæ, the groins, and, as a matter of rare exception, over the entire surface of the body.

Raehlmann¹ describes a blepharitis due to scabies, producing a fall of the eye-lashes. The acarus lodges in the ciliary follicles.

The itching of scabies is occasionally severe, and has, in fact, conferred upon the disease its familiar English title, "the itch." This sensation is usually worse at night, when the parasite is rendered active by the heat of the body in bed, retained by the bed-clothing. It differs somewhat in different cases, being at times the cause of but little complaint. There is nothing characteristic, however, in the occurrence of this symptom, as equally severe pruritus accompanies eczema unconnected with parasites.

The itching which results from the epidermic tunnelling in progress is often noticeably more severe than would be suggested by the moderate number of skin-lesions visible. When these lesions (puncta, vesicles, pustules, blebs, papules, resulting crusts, furrows, excoriations, etc.) are found upon the hands the itching becomes so great that the infested person scratches also the accessible parts of the skin, where there were originally no acari, such as the inner side of the thighs, the lower belly, etc., as Hebra suggests, simply because they are "handy." Hence it is that the picture comes to resemble that of all pruritic and scratched skins.

Several artificial forms of this polymorphic affection are noted occasionally. In infants the face may be invaded after contact with the breast of the mother, or the buttocks after contact with the flexor aspect of the nurse's arm. Large vesicles, and even rupioid bullæ, may result from irritation of the tender skin of children. Again, in subjects predisposed to eczema for any reason the invasion of the parasite in one region of the body, possibly a region of preference, may originate an eczema in another locality whither the parasite has not wandered. In other cases the most aggravated forms of eruption are seen, usually in persons of filthy habits who have long suffered from the malady. Thus, extensive epidermal callosities form, filled with débris of dead parasites unable to find nutriment longer in the cornified rete; or extensive greenish and blackish crusts cover colonies of acari which survive beneath them for generations of their race. The nails in such extreme cases may be involved.

As a rule, the disease does not advance to severe grades. The parasites having gained lodgment in the skin produce characteristic symptoms of the disease in the average of cases, and, though unrecognized and persisting for weeks, are the sources of so much annoyance that treatment of some sort is instituted which is apt to restrict extension of the malady, certainly in America, within moderate limits. Usually after lodgment is effected a week or a fortnight elapses before the first characteristic furrow is formed, though the pruritus is of earlier occurrence. The extension of the disease by the maturing and ravages of young acari requires a few weeks more, so that in the course of from two to three months the evolution of the malady may be considered complete. In the course of about three months more the disease, unchecked, may become generalized.

¹ Journ. de Med. Feb. 10, 1900.

Even the animal parasites elect the soil upon which they thrive, and indeed, after such election, thrive well or ill according to the conditions present. This is not only exemplified in the matter of individual susceptibility, but in the conditions of health of an affected person. Thus, in puerperal and typhoid fevers and other grave states of systemic disturbance the parasites perish in the skin and the eruption disappears; classical symptoms may recur in convalescence if one or more acari have survived with sufficient vigor to reproduce their kind.

Scabies Norvegica ("Norwegian Itch") is a title employed by some authors to designate a severe type of scabies first described by Danielssen and Boeck and later by Fuchs, Bamberger, and others. American cases have been recorded by Hessler¹ and Ravogli.² In this condition there is extensive crusting from desiccation of the exudation furnished by the severe dermatitis induced by millions of mites in all stages of development. Hessler³ reported a case in which the entire surface of the body was covered with large, thick scales, which were shed freely and were riddled with acarian furrows. By counting the number of parasites in a scale of a given size he calculated that the man had upon his person at one time not less than 2,000,000 mites and 7,000,000 eggs. Huebner calls attention to the albuminuria which may occur in severe cases.

Etiology.—Scabies is produced only by the *Acarus scabiei* (or *Sarcoptes scabiei*), and is thus contagious, the parasites being introduced upon the surface of one individual mediate or immediately from the skin of another infested man or an animal. Volk⁴ believes that apart from the pyoderma secondary to scabies, there is at times a true eczema efflorescence, which he ascribes in part only to the excoriations and in part to toxines furnished by the parasites. All persons are supposed to be susceptible to the disease, but the difficulty of intentionally transmitting it by contagion is greater than that of inducing the leech to fasten itself indiscriminately upon any given skin. The brief shaking of the hand or transient personal contacts of the daytime are in many cases insufficient for contagion. Few practitioners of medicine suffer after careful examination of a patient. When a patient affected with scabies is exhibited at the clinic he is minutely and without ill results examined by dozens of students. It is probable that the contacts of the night incidental to the occupation of the same bed, or the use of gloves and other articles of apparel containing parasites or their ova, are essential to transmission of the disease. The parasites capable of inducing scabies in the lower animals (horses, dogs, sheep, etc.) occasionally are transferred to the human subject and are then capable of inducing irritation in varying grades. These parasites, however, rarely beget a disorder of the grade and intensity following infestation with the human acarus. They soon perish from failure to propagate.

¹ Science, Mar. 3, 1893.

² Cincinnati Lancet-Clin., July 16, 1898.

³ Med. News, May 13, 1893.

⁴ Archiv, 1904, lxxii, p. 53.

Pathology.—The pathology of the eruption induced by the parasite is that of the various phases of exudation. The differences between scabies and all other eruptions of similar type depend, in the case of the former, upon the peculiarities of the exciting cause of the disease.

Parasite.—The *Sarcoptes scabiei* (*Sarcoptes hominis*, *Acarus scabiei*, *Sarcoptes communis*) has an oval or nearly orbicular body, whitish in hue, traversed by interrupted rugæ or folds, running for the most part at right angles to its long axis. It is provided with transverse rows of minute bristles on the dorsum, and with groups of trichomæ on the front, sides, and back. There are chitinous hairs at the base of the legs; the two first pairs being provided with pedunculated ambulacra in both sexes, the two posterior pairs terminating each in a long bristle in the female; in the male, the third pair of legs terminate in a bristle, the fourth pair with a pedunculated ambulacrum. The anus lies at the posterior border of the dorsum. The male is 0.2 to 0.3 mm. in length, and 0.145 to 0.19 in breadth; the female is 0.33 to 0.45 mm. in length and 0.25 to 0.35 in breadth. The tunnels contain the excrement and ova, the latter measuring 0.14 mm. in length. The males commonly perish after copulation; the females only after the ova are all excreted. Six-legged larvæ hatch out in four to eight days, slough the skin three times, and then are prepared to burrow (Braun).

The female alone penetrates the epidermis. This act she accomplishes by inserting the head first into the tissues of the skin, the body disappearing afterward, and depositing behind, in the course of her progression downward one or two eggs daily until from twenty to fifty have been laid. The eggs are oval, their longitudinal axes placed transversely to the cuniculus. In the two or three eggs found nearest the female only a yellowish color can be distinguished; in the third to the fifth, traces of the embryo are recognizable; the sixth to the ninth contain larvæ; and in the oldest the head and front legs can be discerned. When mature the shell of the ovum is ruptured, usually between the third and sixth day, and the young acarus reaches the surface of the skin either by making exit at the original point of entry of the mother or by rupture of the roof of the burrow. It subsequently buries itself in the skin for a brief time while the process of casting its slough is completed. The acarus survives but a few days when removed from the skin and immersed in liquids which protect it from the air, such as water, oil, etc.

Sarcoptes scabiei equi, ovis, capræ, cameli, auchenii, suis, canis, and vulpis.—Other families of sarcoptes, or acari, infest the lower animals such as the horse, sheep, goat, swine, dog, wolf, fox, and also fowls, in which the female only burrows into the skin and there deposits ova. Very rarely indeed these are transferred to the skin of man and then commonly soon perish with the result of producing merely a temporary disorder. According to Besnier,¹ in one case

¹ Annales, 1892, s. iii., iii., p. 623.

the entire body of a man was infested, including the face and scalp, after transmission of the parasite from a horse.

Bossellini¹ describes two cases of scabies in an old man and a boy, contracted from an ass. The eruption principally affected the extensor surfaces of the arms and the trunks; there were no intermediate lesions. In the case of a man who contracted the disease from scraping a hog with pruriginous affection of the skin, a generalized eruption followed similar to that seen in the other cases, the animals when examined being infested with acari. Artificial transmission of the disease to a child in the hospital resulted in urticaria without discovery of burrows or acari.

Placal,² observed nine cases in which there was a desquamating erythema in patches, produced by an acarus obtained from the larva of the moth which infested barley. The patients had been engaged in handling the grain.

Other observers have recorded cases where a non-burrowing acarus has invaded the skin and produced more or less evidences of pruritus followed by scratching and infection.

Diagnosis.—The diagnosis of scabies must rest upon the recognition of its special features described above. There are no lesions peculiar to the disease save the cuniculi, or furrows, made by the parasites, and they, it will be remembered, do not appear until one or two weeks have lapsed after infestation. They may also be obliterated or be concealed by excoriations when the finger-nails plough them open, or by pustulation and subsequent crusting when the irritation induced is excessive. In every well-marked case, however, cuniculi can be discovered, if not on the fingers, wrists, or forearms, at least on the penis, the breast near the nipple, or upon some other covered portion of the body. With care and a little dexterity a fine cambric needle can then be forced into the furrow well down to and a little beyond its remote cul-de-sac, and the *fons et origo malorum* be thence extracted and placed under the objective of the microscope.

Next to the cuniculus and its inmate or inmates, the two most important diagnostic features of scabies are the polymorphism of the eruption and the sites of its most frequent occurrence. These sites may be described as the most important of the two. Few skilled diagnosticians would fail to entertain a suspicion of scabies in a case of supposed "eczema," existing upon the fingers, wrists, and penis only, or upon the breast of a mother, and the face and buttocks of her infant, or the arms of its nurse.

It is important to remember that eczema is often attended with very severe itching; that this sensation may be intensely aggravated after retiring to bed at night; that eczema is often limited to the hand; it is not rarely characterized by interdigital vesicles and pustules; and is, indeed, in America much the more frequently encountered of the two diseases. The popular conception of scabies holds

¹ Giorn. Ital. delle Mal. Ven. e della Pelle, 1905, Fasc. 1, p. 64.

² Annales, 1900, s. iv., i., p. 947.

to the belief that the disease is exceedingly common; that every severe itching with a cutaneous exanthem is produced by "insects" or "worms" in the skin, and that transient casual contacts are abundantly capable of transmitting the offending parasite. Many more cases of simple eczema are supposed to be scabies than the reverse. There are few villages in this country which cannot lay claim to an "itch," often known by a name of local significance. Among these provincial titles may be counted the "prairie itch" of the West. These affections are, as a rule, forms of eczema quite unconnected with the existence of a parasite, and incurable generally by the parasiticides too often employed to "kill" the disease. In all such instances the absence of the characteristic features of scabies described above, the absence of a history of contagion, and the presence of an alternating relief and aggravation of the symptoms, will point to the character of the malady. In the severe pruritic affections of the West and the Northwest of America, described in the chapter devoted to the several forms of Pruritus, it is noticeable that the patients are often cleanly—those who are careful as to the hygiene of the body. Scabies is often a filth-disease, and is as a rule recognized among the filthy classes. Of diagnostic importance is the relative rarity of scabies among other cutaneous affections, pruritus included, observed in the United States.

The Statistical Committee of the American Dermatological Association from July 1, 1877, to January 1, 1898, reported 318,500 cases of skin-diseases of all kinds occurring in the United States and Canada. Of this number, 11,560 were instances of scabies, a percentage of 3.66 to the total number of affections tabulated. The influence of temporary increase of population and the crowding together of persons in large centres, many of whom came from foreign countries, is well illustrated by the statistics of scabies.

Treatment.—The treatment of scabies has in view the destruction of the parasite and the relief of the cutaneous disorder which the former has induced. Ordinarily these two indications are fulfilled at the same time. The destruction of the parasite is usually followed by relief of the resulting cutaneous lesions; and the skin, freed from the burrowing acari, is no longer tormented by the scratching, which in extreme cases is not only irresistible, but is also an important element in the aggravation of the lesions. In other cases, however, the resulting dermatitis persists after removal of the original cause of the disease, and it demands special attention. Care should always be had to avoid treating the delicate skin of the infant with the severer remedies efficacious upon the thicker integument of the adult.

Sulphur, in all its forms and various combinations, has long held the highest esteem in the treatment of the disease. Other remedies, however, of acknowledged efficacy are employed with satisfactory results, most of them owing their usefulness to the strong odor they emit. Among these remedies may be named carbolic acid, petroleum, naph-tol, the oils of cloves, cinnamon, rosemary, and mint; tar, balsam of

Peru, and balsam of tolu; styrax, staphysagria, Vleminckx's solution (heretofore described), and *sapo viridis*.

Sulphur is commonly employed in the form of an ointment, 1 to 2 drachms (4.-8.) to the ounce (30.), thoroughly rubbed, first into the affected patches, especially between the individual fingers (or toes), about the wrists, over the palm and dorsum of the hand, into the axillæ, about the nipples, penis, buttocks, or other invaded parts, and, finally, over the cutaneous surface in general, the head alone excepted. If no severe eczematous complications exist, the inunction is well preceded by a warm soap or a warm soft-soap-and-water bath; but in the event of such complication the bath should be deferred as decidedly injurious in the inflamed condition of the skin.

The first inunction is preferably performed at night, after which the patient retires to bed enveloped in woollen underclothing or wrapped in a blanket. It is neither wise nor necessary to induce sudation by these measures, for the skin is best retained in simply a greasy condition unmacerated by sweat. In England it is customary to bathe on the ensuing morning, but it is preferable to defer the bath until the cure is complete, however disagreeable the condition of the integument may be to the sufferer. The sulphur-inunctions are thus repeated for three successive nights, a thorough warm water-and-soap bath being finally employed for the purpose of cleanliness. The clothing meantime should either be thoroughly disinfected with sulphur, be immersed in boiling water, or be subjected in a stove or furnace to a dry heat capable of destroying all acari and ova which may adhere to it.

In France, the routine treatment of scabies is always preceded by a thorough friction for twenty minutes with soft soap, special attention being as usual directed to the invaded areas. This operation is at once followed by a bath in warm water, during which the surface is also thoroughly scrubbed for from thirty minutes to an hour. Lastly, the parasiticide is well rubbed on for fifteen minutes, the patient is redressed in the underclothing (disinfected during the progress of the bathing), and the final cleansing of the skin with water is practised within twenty-four hours.

When a resulting dermatitis demands attention, it is to be treated in accord with the general principles considered in the chapter devoted to that subject. In this case the dusting-powders, the oleated lime-water, and the zinc, diachylon, and even more stimulating ointments, may be employed with advantage. Generally, after a vigorous course of external treatment with sulphur, the patient should be instructed to defer any further topical applications to the skin for a week or more, in order to test the efficacy of the method pursued.

Sherwell¹ finds sulphur in powder as efficacious as in ointment and less disagreeable. He directs the patient, after a soap-and-water bath, to rub gently over the body half a teaspoonful of sulphur lotum, and to dust the same amount between the sheets of the bed occupied

¹ J. C. D., 1899, p. 494.

at night. The bath, the powdering of the body and bed, and a change of clothing are repeated every two or three days. In the average case one week of such treatment is sufficient.

One of the following formulas may be substituted for the ordinary sulphur ointment:

Rx	Sulphur. flor.,	3xiij;	48	
	Potass. subcarb.,	3vj;	24	
	Adipis,	3ix;	270	M.
Hardy's modification of Helmerich's ointment.				

Rx	Styracis liq.,	f3j;	4	
	Petrolei, }			
	Ol. olivæ, }	āā f3ss;	āā 15	
	Balsam. Peruv.,	f3ijss;	10	
	Spts. sapon. virid.,	f3v;	20	M.
				[Kaposi.]

Rx	Potass. sulphurat.,	3v;	20	
	Sapon. alb.,	3xx;	80	
	Ol. oliv.,	f3iv;	16	
	Ol. thym.,	gtt. xv;	1	M.
				[Jadelot.]

Rx	Sulphur. sublim., }			
	Balsam. Peruv., }	āā 3ss;	āā 2	
	Adipis,	3j;	30	M.

For use especially in the scabies of children.

[Duhring.]

Hebra's modification of Wilkinson's salve, Vleminecx's solution, and balsam of tolu are employed for the same purpose.

Kaposi's naphtol formula is:

Rx	Naphtol,	15 parts;		
	Sapon. virid.,	50 parts;		
	Cret. alb. pulv.,	10 parts;		
	Axung.,	100 parts.		M.

McCall Anderson much prefers, on account of its pleasant aroma:

Rx	Styracis liquid.,	f3j;	30	
	Adipis,	3ij;	60	M.
Melt and strain.				

or Schultze's modification of Pastav's formula:

Rx	Styracis liquid.,	f3j;	30	
	Spts. rectificat.,	f3ij;	8	
	Ol. olivæ,	f3j;	4	M.
Ft. liniment.				

A saturated solution of sodium hyposulphite may be used at night, followed in the morning by the application of one part to four of dilute hydrochloric acid. Vlademir de Holstein praises the tincture of benzoin. Jullien prefers to all other remedies Peruvian balsam.

Prognosis.—Scabies is a curable disease, even after persistence for long periods of time. When, however, complications exist, or severe

eczema continues after the efficient action of a parasticide, the patient may experience delay before attaining complete restoration to health.

DEMODEX FOLLICULORUM.

(STEATOZOÖN, OR ACARUS FOLLICULORUM. *Fr.*, ACARE DES FOLLICULES; *Ger.*, HAARSACKMILBE.)

This parasite was discovered in 1841 by Henle. It is a microscopic creature in the form of an elongated and jointed worm, with head separated from the thorax, and eight legs, four on each side, each leg with three articulations, and terminating in three small hooklets. The posterior extremity of the body is a vermiform appendage, terminating in a conical point (Fig. 170).

The *Demodex folliculorum* is found long after birth upon the free surface of the integument, those parts of the skin particularly where the sebaceous glands are large, and on patients affected with acne or seborrhœa oleosa, as well as upon those free from all evidences of disease. It is encountered also in the substance of the comedo-plug, where at times from five to twenty may be discovered in a single follicle. A demodex, which is considered to be a variety of that discovered upon the skin of man, infests dogs, mice, and other lower animals; and may in the latter be the source of disease characterized by furuncular lesions, abscess, and even fatal results. None of these parasites is, however, known to be transmissible to man.

De Amicis,¹ Majocchi² and Dubreuilh³ report cases of pigmentation of the skin due apparently to this parasite. The case reported by Dubreuilh was that of a woman forty years of age. The lips, cheeks, other portions of the face, the mammary surfaces, and chest were the seat of light, yellowish spots where the demodex was discovered in great numbers. The surface was somewhat rugous, due apparently to a peculiar whitish substance, resembling rice-grains, accumulated about the follicular orifices, twelve or more parasites being visible in each field examined. The patient of De Amicis was twenty-seven years of age, the face presenting a *café-au-lait* hue over the lips and chin. Majocchi's was a male patient whose discoloration occurred in the form of a brownish zone surrounding a patch of atrophic lupus. The most effective treatment is by the use of shampoings with green soap.

FIG. 170.



Demodex folliculorum.

¹ Giorn. ital., 1898, iii., p. 205.

² *Ibid.*

³ Journ. de Méd. de Bordeaux, No. 4, January 27, 1907.

PULEX IRRITANS.

(Flea. *Fr.*, PUCE COMMUNE; *Ger.*, GEMEINER FLOH.)

Fleas exist in all parts of the world, the pest which especially attacks man living in dwellings as well as out of doors, infesting crevices in floors, walls, and even the clothing. Fleas belong to the order of diptera; family Aphaniptera, the males being 2–2.5 mm. in length; the females about 4 mm. The insects are reddish-brown in hue; are provided with a head having no bristles which, however, well projected backward, mark its thoracic and abdominal rings. The eggs are white and barrel-shaped and are deposited in the crevices inhabited by the mature insects as well as on the clothing of men. The legless larvæ having fourteen segments are changed to pupæ in eleven days.

The flea which specially attacks man has a laterally compressed body, an oral haustellum, serrated soft mandibles, a tongue sheathed in an inferior labium, and a pair of labial, four-jointed palpi. Each of the triple segments of the thorax bears a pair of five-jointed, double-clawed legs. The nymph is enfolded in a cocoon, but only the mature insects prey upon man. According to Geber, the insect injects an irritating fluid into the skin at the moment of attack. The lesion it produces is a hemorrhagic punctum, followed by a transitory hyperæmia and a hemorrhagic exudation which may persist for a few hours.

The central punctum, or point, distinguishes the wound produced by the insect from macules of simple erythema; but care should be taken when fever is present to exclude the symptomatic erythemata. The site of the wound may become an urticarial wheal.

The flea now shares with the mosquito and the bed bug the odium that attaches to the media of transmission of disease. Lauder-Brunton¹ has called attention to the fact that rat-fleas are capable of transmitting the germs of the plague from rat to man and even of starting epidemics in communities where isolated cases of plague had been supposed effective.

The flea attacks the human skin for the purpose of securing its blood-food; and when the pests are numerous the resulting distress is considerable, the wounds being recognized by a central punctum with an areola of reddish or purplish hue. Urticarial lesions are produced in sensitive skins by the effort to relieve the pruritus produced by the bites of the insects; and in severe cases the nervous system is harassed to a grave point by the resulting discomfort. The petechial character of the cutaneous lesions is often well marked.

It is important to identify flea-bites on the skins of patients suspected to be the victims of typhus or other fevers; and in filthy subjects who are affected with other skin disorders.

Mixed cases of flea-bites with wounds produced by bugs and lice are often seen in the lowest classes applying for relief to public

¹ *Lancet*, 1907, November 9. See also: J. A. M. A., 1907, xlix., p. 2156 (British Plague Commission in India); and Moorhead, *The Military Surgeon*, 1908, Mar., p. 165.

charities; and the deeply pigmented skins they exhibit, often with purpuric lesions distributed over the lower extremities, and commingled with syphilitic eruptions, are in the highest degree confusing. The practitioner should always be on his guard in pronouncing on these cases, especially if the purpuric blotches occur in the cachectic or in those suffering from other diseases than those of the skin.

The fleas of the lower animals occasionally are transferred to the human body, but rarely thrive on such a host.

Treatment.—The treatment of flea-bites is by carbolized, alkaline, and tarry lotions. Stelwagon recommends the wearing of bags filled with gum-camphor or pyrethrum beneath the clothing. Sulphur has been employed similarly.

CYSTICERCUS CELLULOSÆ CUTIS.

Cysticerci have been recognized in the skin and subcutaneous tissues by Rokitansky, Guttman, Schiff, Férréol, Duguet, Lewin,¹ and other observers. The subjects are usually consumers of uncooked meats, especially of pork. In these cases one or many oval or roundish, firm, elastic, cutaneous or subcutaneous, pea- to walnut-sized tumors, isolated or disseminated, unproductive of pain, project from the general level and are enveloped by an unaltered integument. They occur upon the trunk and the extremities. They remain in this condition without change for years and may accompany cysticerci of the brain and other portions of the body productive of the serious disturbance of the economy which such invasion may determine. If the skin-tumors be opened and their contents examined, the parasite (which is the scolex or hydatid of *tænia solium*) will be recognized as an ampulliform sac, with a cephalic appendage, reëntrant or projecting, and provided with four suckers and a coronal of hooklets. By no external characteristics could such tumors be distinguished from others of similar size and external appearance. Only in the rare cases of nervous complication could a suspicion arise based upon the real character of the disorder. Respecting this matter, however, the diagnostician is in no worse position than when called upon to recognize cysticerci of the viscera. Cysticerci of the liver are distinguished during life and subsequently removed by operative procedures.

Diagnosis.—The diagnosis is from gumma, lipoma, epithelioma, and sarcoma. The first occurs only in the syphilitic; the second has a peculiarly uneven surface and firm feeling; the third is largely facial in situation; and the last is of a malignant character and relatively rapid career.

ECHINOCOCCUS.

Weyl and Geber state that the parasite, *Echinococcus* (larva or hydatid of the *tænia echinococcus* of the dog), is found in the human

¹ Cf. Vierteljh. f. Derm. u. Syph., 1894, vol. xxvi., pp. 70 and 271, for review of literature.

skin. Of 336 cases reported by Davaine, the parasite occurred thirty times in muscular and subcutaneous tissues, more often in women than in men. The softish, fluctuating tumors or vesicles produce a disagreeable sensation of tension, and they undergo fatty or other metamorphosis after the death of the encapsulated parasite which usually occurs in from one to two years. Exploration of the superficially seated, fluctuating tumor, covered with unaltered integument, usually demonstrates its nature.

DISTOMA HEPATICUM.

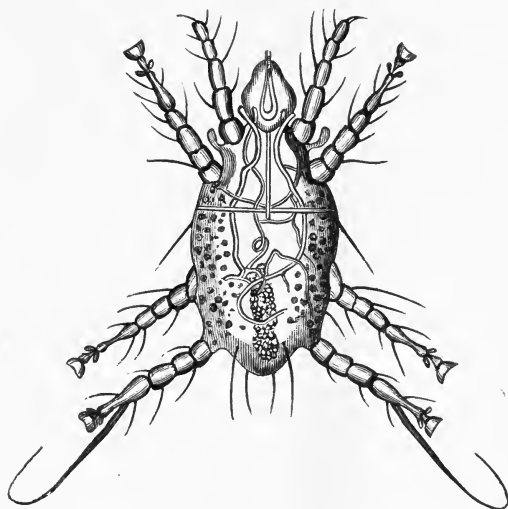
Küchenmeister¹ reports three instances in which the embryos of the large liver-fluke were encapsulated in subcutaneous tissue. The tumors were painful or painless and occurred on the head, trunk, and extremities.

LEPTUS.²

(LEPTUS AUTUMNALIS, HARVEST-BUG, MOWER'S MITE.
Fr., ROUGET; Ger., ERNTEMILBE.)

The *Leptus* (Figs. 172 and 173) is a minute, reddish or yellowish-

FIG. 171.



Leptus americanus.

red insect of the family *Trombidæ*, visible to the naked eye, and found in summer and autumn clinging to bushes and grasses. It is found both in America and in Europe. It attacks man only after its

¹ Loc. cit.

² Cf. William MacLennan, The *Leptus Autumnalis* and its Skin Lesion, *Lancet*, 1905, p. 1765.

accidental location upon the skin, where it perishes in the course of a few hours. In such situations, however, it induces considerable irritation, betrayed in erythematous, urticarial, papular, and even eczema-

FIG. 172.



Leptus. (After KÜCHENMEISTER.)

FIG. 173.



Rouget.

tous symptoms, accompanied by pruritus of various grades. The parts chiefly affected are the ankles, legs, arms, and feet. The mite may be seen in the skin as an orange-reddish or brick-reddish point, which represents often the body of the insect, its head being buried in the aperture of a follicle beneath. Examined after extraction, it is seen to have a relatively large cephalic extremity. It has a short, cylindrical and conical haustellum, composed of fused double maxillæ; and two strong, hooked, five-jointed palpi, which can be rolled up. There are also two hatchet-like mandibles. It has a well-rounded or oval body 0.3558 mm. long and 0.32 mm. broad, provided with three pairs of legs. It is found upon the lower limbs, and also upon the scalp and over other parts of the body. According to Duhring, children are especially liable to its encroachments. The disorder is relieved by the application of balsam of Peru in olive-oil, carbolated oil, spirit of camphor, or other mild stimulant or parasiticide.

There are several species of leptus (*Leptus americanus*, *Leptus irritans*) and other insects living on shrubs and grasses that, especially in the months of July and August, attack the human skin.

Leptus americanus (*Krithoptes monunguiculatus*, Fig. 171) is named by Weyl and Geber as the larva of a mite that annoys laborers in barley. It is yellowish white, oblong or oval in form, averaging 0.022 mm. in length. There is a protrudible tubular haustellum, enclosed by serrated mandibles. On each side are five-jointed palpi. There are four pairs of feet—two on the cephalo-thorax; two, abdominal in situation—all articulated to the epimeres. The tarsus of the first part terminates in hooked claws; the others have haustellum disks on stems. Between the first and second pairs are swinging clubs, indicating the larval condition.

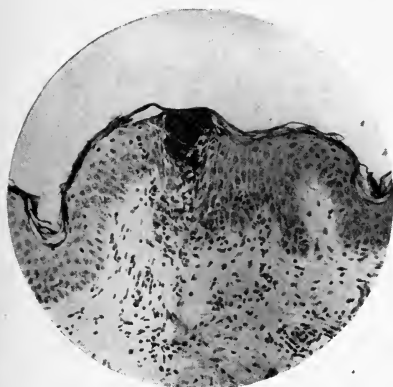
BELOSTOMA.

Schaefer reports irritating effects produced by the sting of the American *Belostoma* ("electric light bug"), a brownish-black insect about five centimetres in length attracted in the summer months by the light of the electric globes in cities. The insect has two pairs of wings and large front extremities armed with claws for the seizing of its prey. Four other legs are thickened and flattened for locomotion in water. It possesses a dagger-like proboscis and is provided with poison-glands furnishing the secretion by which it destroys its victims.

BROWN-TAIL MOTH.

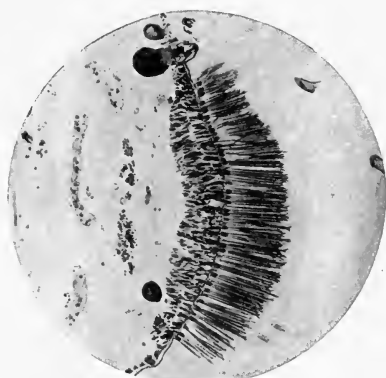
In some of the New England states, notably Massachusetts, New Hampshire, and Maine, an exceedingly annoying dermatitis for several years has been recognized as the result of the introduction of the *Porthesia* (or *Liparis*) *chrysorrhæa* (the brown-tail moth) into certain infected districts. More recently the recognition of the disease

FIG. 174.



Section showing inflammatory changes in the corium 24 hours after the skin had been rubbed lightly with a small brown-tail caterpillar. (Tyzzer.)

FIG. 175.



Section of a caterpillar showing the netting hairs as they are developed upon its skin. (Tyzzer.)

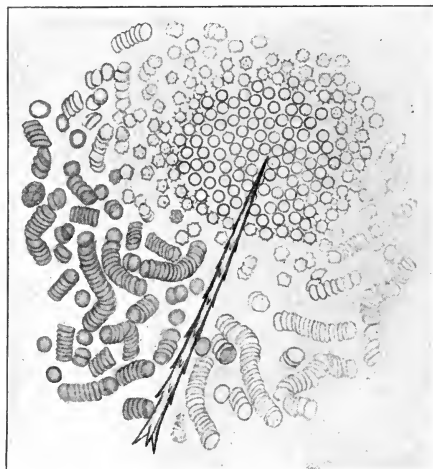
elsewhere, even in some of the Western States, has attracted special attention to its etiology and pathology.¹

Symptoms.—The reaction of the human skin to the "netting hairs" of the moth varies greatly in different conditions and with different individuals. In general, there is produced within twenty minutes after contact, a more or less severe pruritus followed by an urticarial wheal the dimensions of which for the most part corre-

¹ Tyzzer; Journ. of Med. Research, 1907, No. 97, March, p. 43; (also by the same author, VI. Intern. Cong. Derm., New York, 1907) full bibliography and illustration of "netting hairs" embedded in corpuscles of mammalia. White, J. C., Bost. Med. and Surg. Jour., 1901, cxliv., p. 599; Meek, E. K., *ibid.*, p. 657; Fernald and Kirkland Bull. Mass. State Board of Agriculture, 1903.

spond to the area of inoculation. When the offending caterpillar is crushed on the human skin a more or less severe dermatitis results. When infected clothing is worn a diffuse urticarial rash may follow; again, minute discrete papules or vesico-papules of the same size may develop. The eruptive symptoms most often occur when the cater-

FIG. 176.



A sketch showing the effect of the netting hairs of the brown-tail moth upon mammalian red-blood corpuscles. (Tyzzar.)

pillars are maturing, in the months of May and June; but the lesions may be seen earlier or later, and even at any season of the year as the result of incautious wearing of infected clothing.

Etiology and Pathology.—Tyzzar has demonstrated that the disease in man is produced by penetration of the epiderm, and even of the corium, by sharply pointed, barbed “netting hairs” developed on the caterpillar or the moth but found also on cocoons, ova, and imagines. These filaments are barbed for their entire length and average .1 mm. in length and .004 to .005 in width. They possess a thin chitinous wall with a finely granular material filling the shaft.

The barbs of the moth do not produce the resulting dermatitis as a consequence of the mechanical irritation set up by their presence, but possess in addition an irritating substance of a chemical nature demonstrated clearly by the reaction it is capable of inducing in red blood corpuscles. The pathological process in the skin consists of a necrosis of the epidermal cells around the foreign body. Similar reactive effects have been produced after artificial infection of mice.

Treatment.—The treatment is unsatisfactory in consequence of the actual penetration of the barbs into the integument. Soothing lotions and salve are often ineffectual. Excision of the barbs when these can be recognized has been found effective.

IXODES.

(WOOD-TICK. *Fr.*, POU DE BIRS, TIQUE; *Ger.*, HOLZBOCK.)

Several species of tick are recognized, such as the *Rhipicephalus annulatus* (cattle-tick), *Amblyomma americanus*, *Ixodes unipunctatus*, and *Ixodes ricinus* (wood-beetle), the last named being more common in Europe. In America wood-ticks are found in wooded districts, especially where pine- and fir-trees are growing. The female occasionally attacks the human skin by thrusting into it her beak, armed on either side with a maxillo-labial projection having recurved hooklets, the mandibles also presenting similar obstacles to the forcible extraction of the head. After suction of the blood from beneath, the body of the tick swells to the size of that of a pea or small bean, and may remain for several days in this position. At such times the parasite may be mistaken for a small pedunculated tumor. Forcible attempts at extraction of the intruder are liable to detach the mandibles from the body, and thus leave them as the source of future irritation and even disagreeable inflammatory symptoms in the site of the punctured wound. On applying over the tick a drop of spirit of turpentine or benzine the head is spontaneously retracted and the body falls from its position. Soldiers on the plains of the United States accomplish the same end with the juice of tobacco. The sensation produced at the moment of the insertion of the beak of the insect is said to be so trifling as often to pass unnoticed.

According to Modder,¹ the tick is responsible in some cases for the transmission of yaws.

PEDICULOSIS.

(*Lat.*, *pediculus*, a little foot.)

(PHITHEIRIASIS, MORBUS PEDICULOSIS, LOUSINESS. *Fr.*, PHTHIRIASE; MALADIE PÉDICULAIRE; *Ger.*, LAUSESUCHT.)

Lice belong to the order *Rhynchota*; subdivision *Parasitæ*; family *Pediculidæ*. They are apterous, provided each with two eyes, and have an oral appendage capable of both inflicting wounds and producing suction. The lice infesting the human body are recognized as belonging to three varieties: those of the head, of the body, and of the pubes. Of the disorders to which they give rise, it may be said in general that the lesions presented differ according to the region invaded, to the multiplicity of the intruders, and to the length of time during which their ravages have been inflicted. Such lesions, however are those which have been already studied in connection with eczema, urticaria, and the similar disorders resulting from external irritation. Their special peculiarities in pediculosis are owing solely to the nature of the exciting cause and to the mode of its operation.

Evidence is accumulating that the louse, as well as the mosquito, the flea, and the bug, is capable of transmitting certain infectious

¹ Journ. of Trop. Med., etc., London, November 15, 1907.

diseases from man to man, if not also from the lower animals. Mackie,¹ studying the part played by *pediculus corporis* in the transmission of relapsing fever in one of the Bombay settlements, recognized that a much larger percentage of boys than of girls was attacked, the former having been found much more extensively infested with body-lice. In a well-marked percentage of observations, the lice were found to contain living and multiplying spirillæ, the stomach being the chief seat of lodgment, the other organs of the parasites secondarily invaded. After a careful dissection of the bodies of the lice, the author believes that the infectious secretion of the mouth is the medium of transmission. However tangled the masses of spirilla in the stomach, they were always found free in the mouth of the parasite.

Pediculosis Capillitii.

(PARASITE, THE HEAD-LOUSE.)

The head-louse (Fig. 178) is usually of a grayish color, but differs slightly with the hue of the hair on the part which it frequents. Its head presents indistinctly the outline of a trefoil, and is provided with two hairy antennæ (each of five articulations) and with two eyes. Its thorax is relatively narrow, with six tracheal stigmata and three hairy legs on either side, the legs being provided with tarsal hooklets. The abdomen is divided into seven segments, defined by blackish indentations on either side. The males are fewer and smaller than the females, and they present upon the dorsum an anogenital orifice and a large conoidal penis and testes. The females are provided with ovaries and with an anal aperture in the terminal abdominal segment. Coupling is performed with the male beneath.

The ova or "nits" (Fig. 177) are whitish bodies of oval contour, that are glued to the hairs by a cylindriciform sheath of chitin which completely encases each filament. They are deposited in series, as the female traverses the hair from its insertion to its distal extremity, so that the oldest are in general the nearest to the scalp. The young escape from the ova in from three to eight days, and arrive at maturity in from eighteen to twenty days. A single female, according to Kaposi, can lay fifty eggs in six days, and thus in eight weeks have a progeny of five thousand lice.

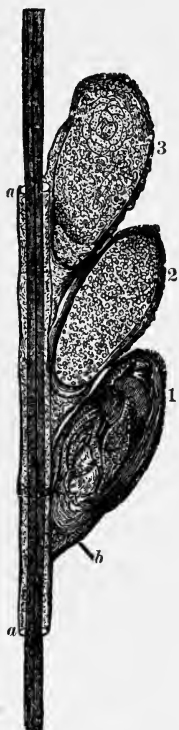
Head-lice usually limit their habitat to the scalp, though, rarely, in elderly men with long hair reaching to a full beard, they may encroach upon the latter. They infest every portion of the scalp, but find the region of the greatest protection upon the occiput. They are found upon children and adults of both sexes, but are furnished best with lodgment upon the scalps of girls and of women covered with long and luxuriant hair. The lesions observed upon a scalp thus inhabited vary according to the age and vigor of the colony. They are few or numerous, discrete or confluent pustules or bullæ; the surfaces are excoriated by scratching, and ooze with serum, pus, or blood;

¹ Brit. Med. Jour., 1907, December 14, p. 1706.

the crusts varying in character according to the nature of the desiccated exudate and sebaceous matters. Often the picture presented is a conglomerate of an artificial eczema and seborrhœa.

The ova, or "nits," are usually abundant upon the hairs of an infested head, and scarcely will escape the attention of a close observer. They are not to be mistaken for the exfoliated, epithelial, and fatty plates seen in seborrhœa sicca, disseminated among the hairs and often perforated by hairy filaments, since the former are

FIG. 177.



Ova of head-louse attached to hair: 1, 2, 3, ova; a, a, chitinous cylinder surrounding a pilary filament; b, chitinous sheath of nearly mature ovum. (After KAPOSI.)

FIG. 178.



Pediculus capillitii—male. (After KÜCHENMEISTER.)

glued firmly in position and resist the bristles of the hair-brush. The peculiarly nauseating odor of the louse-infested, pustule- and crust-covered scalp is not to be confounded with that due to favus of the same region.

In aggravated cases the post-cervical ganglia express, by their increase in size, the degree to which the local irritation has been pushed. The itching is usually severe, and in cases of long persistence in children may produce the usual systemic symptoms of pro-

longed local irritation. Children and patients of impoverished health and with poor hygienic surroundings are believed to exhibit the disease in severer grades than others; but this, if indeed a fact, must at least in part be due rather to the more favorable conditions for development and multiplication of the parasites that are presented in filth-accumulation and lack of cleanliness. In the public charities of large cities children affected with pediculosis capillitii are presented every week who come from the lowest social grades of the population and from the filthiest quarters. In these children it is not observed that the general health of the patients is a factor in the severity of the affection.

Diagnosis.—The diagnosis of pediculosis capillitii is a matter of importance, however simple of accomplishment, since many cases of supposed “pustular eczema of the scalp” have vainly been treated by one physician with internal remedies addressed to the systemic vice supposed to be responsible for the disease which another has relieved after the discovery of a few head-lice. The hairs should always be raised and separated, the scalp carefully be inspected, and the presence of any parasites, and especially ova or “nits” fastened to the hairs, be ascertained. Whether the lice have preceded or followed the eczematous state (and each of these conditions may be noted) is a matter of minor importance. Pustules about the nares and lips, especially of young girls, are often significant of pediculi of the occipital region, the lesions being due to picking and scratching the face under an impulse to relieve pruritic sensations of the scalp induced by the presence there of lice.

Treatment.—The indications in the treatment of pediculosis capillitii are the destruction of all parasites with their ova, and the relief of the induced inflammatory condition of the scalp. Generally, removal of the former is followed by spontaneous disappearance of the latter. For the destruction of the lice the most popular remedy in the United States is petroleum (not kerosene), pure or with equal parts of balsam of Peru (which gives it an agreeable odor), poured over the scalp in quantity sufficient to cover it without overflow upon the brow, temples, and neck. It should be rubbed in with a piece of white (undyed) flannel. At the end of from twelve to twenty-four hours the lice are destroyed, and the ova are rendered incapable of development. This treatment is followed by a thorough shampoo with tincture of green soap, or with toilet-soap and hot water; after this operation the scalp may require a bland unguent, such as vaselin, or a small quantity of scented castor-oil, either pure or in combination with spirit of wine. Kaposi employs petroleum as a parasiticide in combination with olive-oil and balsam of Peru: 5 parts of the first, $2\frac{1}{2}$ parts of the second, and 1 part of the third. Cutting the hair of women and children is unnecessary, as patience and gentleness with the use of the comb will disentangle the most matted masses after the lice have been destroyed. Other remedies are employed locally for a similar purpose, of which the most popular are staphysagria, 1

drachm (4.) of the powdered seeds to the ounce (30.) of vaselin, but especially in decoction; tincture of cocculus indicus; carbolic acid in oil or water; sabadilla; the ethereal oils; and mercurials in ointment and solution, including the mercuric oleates. In cases in which but a few parasites have found their way to the scalp, and that recently, nothing more is requisite than careful use of a fine-tooth comb, scrubbing the scalp with a strongly scented alcoholic perfume, and final bathing with soap and hot water.

The ova adhering firmly to the hairs can be removed by soda or borax lotions, alcoholic solutions, or dilute acetic acid, which are solvents for the gluey material by which the "nits" are secured in place.

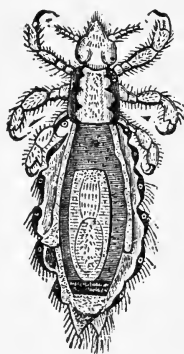
Pediculosis Corporis.

(PEDICULOSIS VESTIMENTI, PHITHEIRIASIS; PARASITE, THE BODY-LOUSE.)

The parasite in this disorder inhabits exclusively the clothing worn next the body. In anatomical peculiarities it resembles the *pediculus capillitii* already described, being, however, larger in size, the females also larger than the males. The thorax is separated from the abdomen, the latter being hairy, yellowish at the margins, and provided with eight segments. The eyes are black and very prominent in both sexes; and the periods requisite for the maturing of the ova and young are those named respectively in connection with head-lice. In color they vary from a dirty white to a light-grayish hue when undistended with blood. In the reverse of this last-named condition they may be recognized as having a dull-reddish or a purplish color, when they are also more indolent in their movements. They measure from 2 to 3 mm. in length and 1 to 1.5 mm. in breadth. The female lays from seventy to eighty eggs, from which the young are produced in from three to eight days, and are capable of reproduction in a fortnight more.

They inhabit the seams of undergarments, where their ova are also deposited; but in coarse woollen or flannel shirts they find sufficient shelter in the meshes of the material of which the clothing is made; this they leave temporarily, solely for the purpose of obtaining nutriment from the skin of their host, and hence are not recognized upon the free surface of the integument. Upon rapid removal of the clothing of an infested individual a few lice may occasionally be encountered, hastily seeking a place of refuge, though this is rather the exception to the rule. It thus may happen that a louse-bitten patient will not exhibit the source of his trouble to his physician after a

FIG. 179.



Pediculus corporis—female. (After KÜCHENMEISTER.)

recent and complete change of clothing. The greater then the importance of being able to recognize the clinical features of the malady in the absence of the parasite. This recognition is comparatively easy to one who has made himself familiar with the symptoms of the disorder.

Swammerdam's original view that the louse is not provided with mandibles by which it can inflict a wound, but with a haustellum by which the blood is sucked up to the head of the parasite, is confirmed by Schjödte. The parts of the head resembling mandibles in appearance are really situated beneath its skin. A louse which previously had been starved, when applied to the skin retracted its limbs, arched its back, and inclined its head obliquely downward, as it projected forward and retracted a "small, dark, narrow organ," by which it was firmly held in place. A triangular blood-red point soon became visible in front of the eyes, rapidly and alternately contracting and dilating, and followed by energetic peristalsis of the gastro-intestinal tract. "If the head then be cut off in front of the eyes, and the haustellum carefully be extracted, the latter can be recognized as a brownish protrusion, armed with terminal recurved hooks, from which depends a delicate membranous tube varying in length. The mouth is like that in the rhyncota generally, but differs in the circumstance that the labium is capable of being retracted into the upper part of the head, and has a fold in it when so retracted. In order to strengthen this part, a flat band of chitin is placed on the under surface; and it is thinner in the middle in order that it may bend and fold a little when the skin is not extended by the lower lip. The latter consists of two hard lateral pieces, of which the fore-ends are united by a membrane, so that they form a tube, of which the internal covering is a continuation of the elastic membrane on the top of the head. Inside its orifice are a number of small hooks, which assume different positions according to the degree of the protrusion; and if this be pushed to its highest point, they form a collar of hooks curved backward like barbs. The pediculus first inserts its labium into a sweat-pore and protrudes the lip. When the hook is securely attached to the parts around then the first pair of setæ (the real mandibles transformed) are protruded, and these are toward the point invested by a membrane so as to form a closed tube, from which again is exerted a second pair of setæ or maxillæ, which form a tube and end in four small lobes placed crosswise. The whole forms a membranous tube, along the walls of which retiform mandibles and maxillæ are placed as long, narrow bands of chitin. This tube can be lengthened or shortened at pleasure."

This explanation of the mode in which the louse attacks the skin is probably true of each of the varieties which infest the human body. The invaded follicle, after the withdrawal of the haustellum, becomes the seat of a circumscribed hemorrhage. None of the anatomical peculiarities described above, however, completely explains the characteristic pruritus of pediculosis corporis, for it can scarcely be ques-

tioned that it is not merely at the moment of attack or penetration that the suffering of the victim is greatest. The pruritic condition of the louse-wound persists, indeed usually attains its maximum, after withdrawal of the pediculus, and is without doubt greater than that awakened by merely mechanical puncture of the epidermis.

The lesions seen on the skin thus invaded are proportioned, as in pediculosis capillitii, to the size and age of the colony of parasites. Excoriations, usually linear, occasionally circumscribed, varying in depth and length, radiate irregularly from each louse-wound, and they may be commingled with minute papules, transitory wheals, or, in rare, aggravated cases, with the typical signs of diffuse eczema. All are produced by scratching in order to relieve the pruritus. Crusts, often composed of desiccated blood, rarely of serum or pus, minute and capping the wounded follicle, or linear and coextensive with the excoriations produced by scratching, are generally conspicuous. In older cases these lesions are followed by the usual sequel, pigmentation, the latter being a partial indication of lousiness which has long been tolerated.

In America it is rare to note the severe and intense forms of the malady, resulting from long-continued neglect of the skin, that occur in Germany. In these cases follow: dermatitis, rupioid crusts, furuncles, abscesses, carbuncles, and ulcers, resulting in serious implication of the skin which may persist for weeks after the clothing has been freed from lice, and finally leave a deep-tinted, diffuse pigmentation of the skin-surface, suggesting that of the negro or of the patient affected with Addison's disease.

Diagnosis.—The diagnosis is a matter of importance. Patients will visit physicians, claiming that they have suffered from a "humor of the blood," who have been swallowing drugs for a long period of time, in the vain hope of obtaining relief, with lice, at the very moment of uttering the complaint, crawling over their persons. Even those of good social position and cleanly habits will occasionally suffer after accidental contacts in the tram-car or railway-carriage, the hotel, the theatre, or other places of public resort. There are certain points to be carefully noted in this connection. Excoriations over the nucha, about the shoulders, loins, buttocks, and external faces of the thighs, all visible at the same time, are highly suspicious symptoms; as an eczema, when equally diffuse, is sure to be accompanied at some point by perfectly classical features; and generalized pruritus is exceedingly rare, its localized varieties concerning chiefly the regions about the mucous outlets of the body. There is a picture highly suggestive of pediculosis exposed to the eye when the trunk of an infested patient is viewed from behind. The lesions are more discrete, more irregularly distributed and more intermingled with long scratch-marks, reaching, for example, quite over the point of one shoulder, than in most disorders with which pediculosis vestimenti could be confounded. Here and there minute blood-specks tell a significant tale. When clinical patients exhibit syphilodermata inter-

scattered among characteristic lesions of pediculosis corporis the students themselves in such cases can ordinarily point out the particular symptoms referable to the separate disorders present.

In private practice it is usually advisable, for obvious reasons, to secure the *corpus delicti* before informing the sufferer of the nature of his or her complaint. In the case of male patients it is well to take a position in the rear, and when the underclothing is drawn well up from the shoulders a careful scrutiny of it may be made while the applicant for relief supposes that attention is directed instead to his person.

Treatment.—The treatment of the disorder concerns largely the clothing. The latter requires immersion in boiling water, or it may be wrapped in paper and subjected to a temperature in an oven (160°–175° F.) sufficient to destroy the lice and their ova. In case of recurrence of the malady the clothing is to be again subjected to the same process. Usually the irritation of the skin resulting from the invasion promptly subsides. When several members of one family suffer, all clothing worn must be subjected to similar treatment. If the skin has been unusually tormented by scratching, warm alkaline baths will afford some comfort, and they may be followed by a bland unguent or by one of the dusting-powders. For immediate use, before the clothing can be rid of the intruders, a small cheesecloth bag containing sulphur in stick or in powder may be worn beneath the underclothing, or the powder may be dusted in the clothing and rubbed over the body; or a parasiticide ointment may be ordered as recommended by Duhring, prepared by adding 2 drachms (8.) of freshly powdered staphysagria to the ounce (30.) of hot lard, strained and cooled. The surface of the skin may also be anointed with carbolic acid dissolved in oil or in water.

Pediculosis Pubis.

(CRAB-LOUSE. PARASITE, THE PUBIC LOUSE. *Fr.*, MORPION.)

In this disorder the genital region is chiefly involved, though in exceptional cases all the hairy portions of the skin may be invaded, including the eyebrows, the eyelashes, the axillæ, and the moustache and beard, the hairy chest, and the hairy legs of men. The body of the pubic louse (Fig. 180) is smaller than either of those described above. Its head is also attached more closely to its thorax, having a shape which is compared with that of a violin. The thorax is not distinctly separated from the abdomen, and of the six stout legs with which the louse is provided, the second and third pairs are conspicuously powerful and armed with relatively large hooks at the tarsal extremity. The resemblance of the latter to the claws of a crab has given to this creature the common name of "crab-louse." The lateral abdominal indentations are much less distinct than in the other varieties; and the blackish marginal marks of body- and head-lice are here scarcely apparent. The abdomen is also much

elongated, having a more rounded contour. The pubic louse is provided on its lateral borders with eight short conical feet, terminating in bristles. It is also distinguished from the others of its family by the length of its anal bristles and by the peculiar shield-shaped carapace which covers nearly one-half of the dorsum. The male is from 0.8 to 1 mm. long, and from 0.5 to 0.7 mm. wide, being thus from 1 to 1.5 mm. smaller than the female.

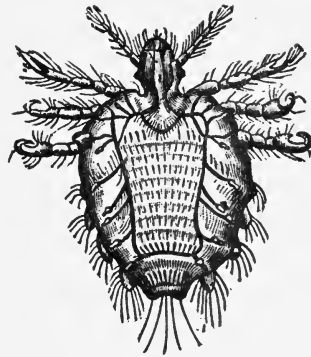
The pubic louse is much more inactive than the others, and does not ordinarily escape its pursuer. It buries its head deeply in a follicular orifice, and steadies itself in this position, where it may remain for some time, by grasping the adjacent hairs with its short and powerful claws. A moderate degree of force is required for its dislodgment from this favorite position, and when removed its grasp of the hair to which it clings is so firm that the latter usually slides for its entire length through the claw of the louse. Occasionally it may be found creeping over the skin or clinging to hairs at a distance from the skin-surface. The pyriform ova are smaller and fewer than those of the head louse, though having a similar color, and are, like the latter, attached to the hairs by a firm chitinous glue.

Pubic lice are usually acquired during the contacts incidental to the sexual act; are, hence, more frequently encountered among adults; but may, without question, be transmitted mediately by occupation of beds and clothing which have been used by infested persons. They are thus, though rarely, found in children of both sexes.

The lesions induced are those produced by the wounds inflicted by the parasites and by constant scratching, though these are rarely severe. In a few cases a severe dermatitis follows the ravages of the lice, but in such event the complication is chiefly owing to unnecessarily severe self-treatment of the disorder, patients being often morbidly anxious in their efforts to rid themselves of the pests.

Diagnosis.—The diagnosis of pediculosis pubis is between eczema and pruritus genitalium. The disease last named is, in both sexes, accompanied by itching, and that often of intense grade; but when this is diffuse and symmetrical in distribution it is not limited particularly to the hairy parts. Eczema of the genitals is not often produced by parasites of that region, and it may readily be recognized by its characteristic features. Both disorders are often, indeed, limited to symmetrical patches upon the side of the scrotum or one labium. The discovery of the parasite, however, in pediculosis pubis is always essential, and requires merely careful inspection and a good

FIG. 180.



Pediculus pubis. (After SCHMARD.)

light. The lice may be recognized either at or near the point of implantation of the hairs, which also display ova except in very recently infested individuals. The reddish excrement of the parasites mingled with scratch-marks and excoriated papules of small size may also be observed. Patients are often made aware of their condition by a sensation of crawling over the parts. Scratching of the pubic region in adults of both sexes should awaken suspicion of the disorder.

Treatment.—The disorder is treated commonly by the topical application of mercurial ointment, which is a disagreeable and rather filthy medicament for this locality. The 10 per cent. oleate may be substituted for it, or, even preferably, corrosive sublimate in solution, from 3 to 4 grains (0.2–0.268) to the ounce (30.). Petroleum and olive-oil with balsam of Peru, in the proportions given above in connection with the subject of pediculosis capillitii, furnish an effective combination. Staphysagria, carbolic acid, cocculus indicus, or one of the other substances used in the disorders occasioned by the animal parasites, may be substituted if desired. It is usually better to defer bathing until the remedy selected for the destruction of the lice has been applied on several occasions, after which a warm water-and-soap ablution will commonly end the trouble. It is needless to clip the pubic hairs. Should a dermatitis follow, an appropriate treatment includes hot bathing and the blander lotions and unguents.

Maculæ Cœruleæ (*Fr.*, *Taches ombrées*, *Taches bleuâtres*) are pea- to small-coin-sized grayish stains found on the chest, belly, thighs, and upper arms, especially of blonde subjects. They have a steel-gray tint, do not disappear under pressure, and are believed to be, for the most part, signs of infestation with the pubic louse, though occurring in predisposed individuals independently of such invasion. Duguët,¹ after inoculations with the juices of crushed pediculi, believes that he has demonstrated that the lesions spring from pigment originating in the body of the insect.

Vagabonds' Disease.—This is a term given to the condition of the skin recognized among tramps, inmates of poorhouses, and the filthy and neglected in general. The skin of such persons is often densely indurated, harsh, dry, and deeply pigmented, in consequence of much scratching and a consequent hyperæmia. This condition is produced chiefly by phtheiriasis; but is often a resultant of the incursions of several parasites, including those of the bed and of the clothing. It is also a consequence of persistent neglect of the bath.

¹ *Annales*, 1880, p. 544.

CIMEX LECTULARIUS.

(BUGS, BEDBUGS, ACANTHIA LECTULARIA. *Fr.*, PUNAISE DES LITS;
Ger., BETTWANZE.)

Strictly speaking, the bedbug is not a parasite of man, but finds its congenial habitat in the bed, bedding, and bed-covering, and the walls and floors of apartments occupied by persons of both sexes and all ages. It may find a host in certain of the lower animals such as the guinea pig. It infests also furniture, including chairs, sofas, and the cushions of seats occupied in public vehicles and hotels. From the cracks, crevices, seams, folds, or other protected points where it has found lodgment, it emerges usually at night, for the purpose of securing its nutriment in the blood of its victims. It is a pest as ancient as the day in which Dioscorides wrote.

This insect has a rusty or reddish color, this differing slightly according as it is or is not distended with blood. It is an apterous member of the order *Cimicidæ*. It is provided with a blunt-pointed head, broadly attached to the thorax; two long, slender antennæ; and a three-jointed haustellum capable of projection and retraction beneath the head. There are three pairs of long, slender legs by which it is enabled to accomplish rapid movements. The abdomen is broad and flattened, and oval in shape, with nine segments. The parasite emits a disgusting odor, which is much more distinct when it is crushed.

As the germs of anthrax have been recognized in the bodies of bed-bugs fed upon inoculated guinea pigs,¹ the possibility that these pests, like the mosquito, may become distributors of infectious disorders is great. They have been suspected as the media of transmission of the plague; and recently Goodhue² has stated that the bacillus lepræ has been demonstrated in the bedbug. Mackie³ has found spirillæ of relapsing fever in the stomach of bedbugs.

The wound inflicted by this bug is accomplished with or without the consciousness of its victim, who in the former case is made aware of a transitory prick or sting. Soon after, decidedly pruritic, burning, or stinging sensations are experienced, and the wound becomes the seat of an urticarial wheal. The lesion then, examined soon after the infliction of the wound, is seen to be small pea- to bean-sized, and in the form of an elevated and circumscribed "button" or papulo-tubercle, either whitish in the centre or exhibiting there also the hyperæmia which distinguishes its peripheral zone. After the lesion has begun to subside and lose its acute features, which may not occur for several hours if it be irritated by rubbing or scratching, a minute reddish punctum may be seen marking the original site of the wound.

The lesions are usually multiple even when but a single assailant

¹ McClintock, J. A. M. A., 1907, xlix., No. 23, p. 1933.

² "Mosquitoes and their Relation to Leprosy in Hawaii," *Amer. Med.*, 1907 (New Series), ii., pp. 593-598.

³ *Lancet*, 1907, September.

has been present, the insect taking apparent delight in obtaining its nutriment from several distinct points upon one surface. In this way at times its course upon the integument may for a short distance be traced. In cases in which the pests are numerous, as in filthy dwellings, prisons, ships, and barracks, and when infants have been attacked, the resulting eruption is often greatly masked by the scratching and resulting excoriations of the skin-surface. In this way vesicles, pustules, crusts, purpuric blotches, and even skin-infiltrations may be found, instead of the rosy or light-reddish typical wheals of recent cases in patients with fair, clean skins.

Diagnosis.—The diagnosis is a matter of importance, and upon it may hang a professional reputation. Physicians are often consulted respecting these lesions by patients who believe themselves to be suffering from “hives,” “humors,” exanthemata, and even from syphilis. The insect attacks the parts of the body to which access is easy as the patient sits or reclines on the back or side, including the buttocks, the thighs, the shoulders, the loins, and the neck, in that order of frequency, rather more largely than the legs, much less frequently the scalp, the face, and the genitalia. The eruption is not to be confounded with urticaria *ab ingestis*, which is more apt to be symmetrical in disposition.

Treatment.—The eruption is best relieved by the topical application of spirit of camphor, alcohol, weak carbolated lotions, or solutions of boric acid, 1 drachm to the pint (5. to 500.). Untreated, it disappears spontaneously when the source of the disorder is removed. The most effective treatment is by prophylaxis, with soap, corrosive sublimate solutions in alcohol, and hot water employed over all accessories of the dwelling-house inhabited by the insects. Once discovered to be present, infested furniture should be scrubbed and all its crevices treated with a strong solution of corrosive sublimate in water and bed-clothing be immersed in boiling water.

MOSQUITOES.

The traumatisms of the skin produced by the mosquito have been invested with a striking significance as a result of recent bacterial investigation of the origin of several serious tropical affections.

Non-pathogenic mosquitoes (gnats) constitute the larger of the chief classes of these insects; of the pathogenic class the more important are the *Anophelinæ*, of which there are eighteen genera effective in the transmission of malarial fevers; the *Culicidæ*, which transmit filarial disease; and the *Stegomyia fasciata*, which has been demonstrated to be the medium of transmission of yellow fever. Goodhue (loc. cit.) claims to have recognized the bacilli of lepra in the body of the female of *Culex pungens*.

The impregnated female deposits her ova on the surface of stagnant water where in from three days or more the larvæ are hatched. After several moultings the pupa stage is reached; later the insect emerges from the ruptured pupa-case and flies a few hundred feet to

seek its nutriment in mammals, fish, reptiles, or other insects. The female mosquito alone is the germ carrier. Much of the advance made in tropical countries in the direction of elimination of endemic disorders has been brought about by scientific destruction of the ova or larvæ of these insects before they arrive at maturity.

The bodies of immigrants newly arrived during the summer season in America, from countries where the mosquito is either rare or does not exist, often present singular and even formidable evidences of the attacks of these insects. The skin, unaccustomed to such depredations and quite unprotected, will often be found greatly swollen, and of a light-reddish hue suggestive of erysipelas. Here and there bullæ are conspicuous, which add to the resemblance to the last-named disease. The features, in consequence of the tumefaction, vesiculation, and papulation, may be so swollen as to present a conspicuous deformity; and the forearms, and even the arms, seem greatly increased in size from the same cause. The feet and legs also may, in the unconsciousness of sleep, be exposed in hot weather to the depredations of these marauders, and in the same way the back, the buttocks, and, rarely, even the genitalia may present the same signs of inflammation. The matter of chief moment is the correct diagnosis of such cases, as many patients seeking relief under such circumstances have been treated for disorders with which they were not affected.

Other insects may persistently or occasionally attack the human skin; midges (*Simulia*); bees (*Apes mellifera*); and wasps (*Vespidæ*). They produce by their bites or stings various cutaneous lesions, including urticarial wheals, papules, ecchymoses, and in rare cases even ecchymomata. The lesions produced by the midge, like those of the mosquito, are seen on the face, the hands, and exposed parts; though, when numerous and voracious, these insects will penetrate the clothing for the purpose of obtaining blood. Severe eruptive lesions are often seen in America on the faces and extremities of infants and children exposed during the night to the incursions of these marauders. The skin-symptoms may be treated locally by aqua ammoniæ or spirit of camphor.

PROTOZOA AND SPOROZOA.

The relations sustained by some forms of protozoa to diseases of the skin and of other organs in man are as yet undetermined. The so-called psorosperms observed by a number of investigators in Darier's disease, carcinoma, molluscum fibrosum, Paget's disease, herpes zoster, and varicella have been demonstrated clearly to be bodies produced by cell-transformation.¹ It is well known, however,

¹ Cf. Gilchrist, Johns Hopkins Hospital Reports, i., 1896; and Second Annual Report of the Cancer Committee of the Harvard Medical School, Journ. Med. Resch., 1902, vii., No. 3.

that the livers and other organs of rabbits and of some other animals often contain coccidiæ (a subclass of sporozoa), and several instances of peculiar forms of disease in man have been reported in which protozoa were satisfactorily demonstrated. Psorospermiosis of internal organs of man is described by Osler¹ and by Blanchard.²

Protozoan and coccidoidal infections of the skin are considered with cutaneous blastomycosis.

¹ Principles and Practice of Medicine, p. 1080, p. 682. New York, 1895.

² Bouchard's *Traité de Pathologie générale*, tome ii., p. 682. Paris, 1896.

CLASS IX.

DISORDERS OF THE APPENDAGES.

In this class of disorders are grouped the functional affections of the sweat-glands, or coil-glands, the sweat-pores, and the sebaceous glands. These disorders may be betrayed in quantitative or in qualitative changes in the secretion, or in retention of the latter in the whole or in a part of the secretory apparatus. When a disease of the skin ceases to be purely functional in type, and is accompanied by an exudative process, glandular or periglandular in situation, such disease is properly classed with another group of affections. With a view, however, to convenience of arrangement there have been placed in this class a few dermatoses which cannot be regarded as strictly functional affections.

SWEAT-GLANDS.¹

HYPERIDROSIS.

(Gr., *ὑπερ*, in excess; *ἵδωρ*, water.)

(IDROSIS, HYDROSIS, EPIDROSIS, SUDATORIA, POLYIDROSIS, HYPERIDROSIS. *Fr.*, HYPERIDROSE.)

Hyperidrosis is an exaggerated quantitative effusion of sweat, localized or generalized, moderate or severe, acute or chronic, persistent or relapsing, the secretion accumulating in visible drops upon the surface of the skin.

Symptoms.—This condition may be physiological, as the result of active exertion in a medium of high temperature; or it may be pathological in character, and in the latter case be either general or partial.

The expression, general sweating, is self-explanatory. The entire skin of the body participates in the process, and the surface conditions which result favor the development of intertrigo, sudamina, miliaria, and occasionally of folliculitis and furunculosis. Local hyperidrosis is the exaggerated quantitative effusion of sweat limited to certain definite portions of the skin, as the palms, the soles, the dorsa of the hands and feet, the interdigital spaces, the genitals, the axillæ, and the temples. In such cases the secretion occurs moderately or greatly in excess, varying in this respect somewhat in different degrees of

¹Excellent bibliographies relating to the various disorders of the sweat-glands may be found in Török's contribution to the subject in Mraček's Handbuch, Bd. 1, pp. 386-485.

temperature and in rapidity of the circulation. It may involve one or both sides of the body, being generally symmetrical upon the extremities and asymmetrical upon portions of the face.

The typical expression of this disorder may be studied in the hands, which are continually moistened, clammy, or dripping with fluid within a brief time after the most careful drying of the parts. The sweat is commonly cold to the touch of another. In the case of a woman, the instincts of whose sex prompt her to take such precautions, the dress is constantly protected from contact with the macerated palms by a handkerchief or similar article which is always in readiness, and frequently no small complaint is made, of the disagreeable results produced after wearing kid gloves for even a short time, the material of which is soon soiled by its complete saturation with the secretion from the skin. The disadvantages thus arising in individuals of both sexes who are engaged as tradespeople, artists, hand-workers, etc., are obvious. The skin on the palmar surface of the hand, and often on the dorsal aspects of the fingers has a sodden, thickened appearance, and some degree of hyperkeratosis is always present in severe cases. Occasionally vesicles are formed which later become centres of slight exfoliation.

With and without this local excess of perspiration involving the hands, occurs the hyperidrosis of the feet. The outpour of sweat varies in amount from a mere dampening of the feet to a complete saturation of the stockings and the leather of the boots or shoes with the secretion. There is usually a very offensive odor of the region, originating partly in the primary fetor of the secretions themselves, and partly in the subsequent chemical decomposition of the latter, rapidly progressing under the influence of the soiled and often stinking investments of the feet. The integument, constantly macerated, may become both painful and tender and slightly reddened; occasionally there is vesiculation or exfoliation of patches of sodden epidermis, especially between and beneath the toes, in which situation fissures are prone to occur. As upon the hands, though to an even greater degree, an hyperkeratosis is found, which may be regarded as an effort of the organism to compensate for the effect of constant maceration. The nails are usually thickened and distorted, the result of participation in the keratotic process.

Hyperidrosis of the axillary and genital regions is very often attended with more or less bromidrosis and almost invariably leads to some degree of intertrigous irritation. The wearing of impervious shields by women to protect the dress waist from unsightly staining favors the retention and decomposition of the secretion, and thereby adds to the macerating and irritating effects upon the skin of the part. Itching is a frequent complication, and folliculitis, and furunculosis, or a dermatitis seborrhoïca may supervene. Excess of sweat in the inguinal and genito-crural regions, because of the peculiarities of the location, is especially apt to decompose. More or less fetor results, and if the individual is inclined to obesity a troublesome intertrigo or follicular dermatitis may develop.

Etiology.—General sweating to a pathological extent occurs in the obese and in those who are subjects of systemic disease, notably tuberculosis, acute rheumatism, malaria, rickets, exophthalmic goitre, and various febrile disturbances. It may result from adynamia due to any cause. Both local and general hyperidrosis has been observed in organic diseases of the nervous system, such as general paralysis¹ and myelitis. Traumatisms, gliomata, gummata, scleroses, and other lesions affecting the cerebrum, medulla, cord, ganglia, and nerve trunks have all been followed by hyperidrosis of the entire body or of a part only. It is extremely common in persons with an habitually rapid heart, and in those who use too freely the narcotico-stimulants, such as alcohol, tobacco, coffee, and tea.

The frequent obscurity of etiologic relations in hyperidrosis is entirely explicable when certain facts are considered. The predominant influence of the nervous system must be admitted. Though but indefinitely located, the existence of special centres and fibres in the central nervous system for the control and operation of the sweat-glands is evidenced by a mass of clinical observation. The relation of the sympathetic nervous system to all glandular activity is well known. The positive results of experimentation and the deductions warranted by clinical experience indicate that irritation of those centres and fibres, either central or sympathetic, which are secreto-motor, or paralysis of those which are secreto-inhibitory, accounts for general or local hyperidrosis according to the extent of the distribution of the nervous elements concerned. The etiologic complexity of the situation arises from the fact that this stimulation or paralysis may follow numberless causes; emotion, action of circulating toxins, direct injury, pressure effects, reflex action from the periphery or from within, etc. The efforts of the clinician in accumulating data must be supplemented further by those of the anatomist and physiologist before the etiology of hyperidrosis is completely worked out.

Pathology.—Robinson, who examined a number of sections from the palm of the hand, failed to detect any abnormal feature either in the glands or in the epithelium. The disorder is to be regarded as purely functional; and any anatomical changes in the coil-glands or the sweat-pores are probably accidents of such derangement of function.

Treatment.—When universal, hyperidrosis is to be treated internally by the aid of such remedies as are indicated by the general condition of the patient, and especially by the condition of the heart. The various ferruginous tonics, mineral acids, arsenic, strychnine, strophanthus, quinine (the latter particularly when, as is often the case, a malarial affection is responsible for the disorder), and ergot, with both belladonna and atropine, are all of unquestioned value. Crocker administers sulphur internally. Even though but temporarily serviceable, belladonna and atropine are well used at the outset of most cases. Aconite, jaborandi and pilocarpine, white agaric

¹ Cf. De Montzel, *La Presse Méd.*, 1903, January 31.

(agaricin is recommended in doses of $\frac{1}{6}$ grain (0.011), repeated as required), carbolic and salicylic acids may be named as in the second rank. The narcotico-stimulants as a rule should be excluded.

External treatment, which is often promptly efficacious, should not be neglected in any case. The simplest method is by wiping, not washing, the skin-surface until it is dry, and applying a dusting-powder, such as lycopodium, talc, salicylic acid, boric acid, bismuth, magnesia, chloral hydrate (1 part to 5 or 6 of starch), or starch. Alternately with either of these, or in lieu of them, baths or lotions may be employed, aqueous or alcoholic, and medicated with corrosive sublimate, formalin (1 to 5 per cent. solution), tannic acid, ferrous sulphate, naphthol (Kaposi), turpentine, zinc sulphate, alum, potassium permanganate, or common salt. Daily sponging of the affected surface with weak solutions of formalin (1 to 6 per cent.) will remove the odor, and will in most cases greatly diminish the amount of perspiration, but on suspension of the treatment the condition usually returns. Fox¹ advises a lotion containing 1 part of quinine to 100 of alcohol. Van Harlingen recommends the use of juniper-tar or carbolic acid soap with the bath as alone sufficient to relieve some cases. Grosse² praises highly tannoform, either in powder (1 part to 2 of talcum) or as a 25 per cent. plaster.

For hyperidrosis of the feet the treatment by the method of Hebra has deservedly high repute. It consists in neatly and completely enveloping the entire foot, the toes separately, after thorough washing and drying, in strips of cotton-cloth over which is spread to the thickness of a common knife-blade the unguentum diachyli albi. This unguent is made by boiling 1 part of the best litharge with about 4 parts of pure olive-oil, to which a little water is added while the materials are stirred together over a slow fire. The parts are well bandaged, and the patient either remains subsequently at rest or pursues his vocation, wearing over the feet shoes and stockings which have not previously been worn. In twenty-four hours the feet are redressed without washing, after dry rubbing with charpie and a dusting-powder. This treatment is repeated daily for from ten to twenty days, after which a dusting-powder (boric acid) may be substituted for the local dressing. There occurs a parchment-like desquamation of the epidermis in thick, yellowish-brown lamellæ, beneath which is formed a new and at first tender but apparently normal epidermis. When the latter has lost its tenderness the feet are for the first time washed with water. In case of failure the routine of treatment is repeated as often as requisite. It is scarcely necessary to add that no ill effects are known to have resulted from the therapeutic measures adopted in checking a local hyperidrosis. For the diachylon salve there may be substituted tar, ichthyol, or naphthol ointment.

Gerdeck³ makes three applications to the soles, at intervals of

¹ J. C. D., 1885, iii., p. 24.

² Klin. therap. Wehnschrift., 1889, Nos. 16 and 17.

³ La Riforma Medica, 1898, No. 38.

about eight hours, of the strongest solutions of formalin the skin of the individual will bear. In some instances full strength is well tolerated. A few drops are put in the shoes, the influence on the leather being preservative and not destructive. Relief follows for several weeks, when the treatment may be repeated.

Frederick employs finely pulverized tartaric acid, applied at first with some caution, and always in small quantities. Stewart first bathes the feet in hot water and then soaks them for a few moments, once only, in a solution of potassium permanganate, 4 to 6 grains to the ounce (0.266–0.4 to 32.), after which the plaster selected for use may be applied as directed above. Legoux orders pediluvia of tar-water twice daily for three days, followed by painting of the feet with a solution of iron perchloride. Morrow¹ recommends foot-baths in the extract of pinus Canadensis, followed by the application of boric acid, or of salicylic acid mixed with lycopodium. The use of the x-ray has been very effective in cases treated by us. In axillary hyperidrosis we have found it useful pushed to the point of producing a slight reaction.

Prognosis.—The future of any case of hyperidrosis is uncertain. The disease, whether local or general, may spontaneously disappear, may recur, may promptly be amenable to treatment, or may prove obstinate to all therapy. Myrtle² reports the case of a male patient, seventy-seven years old, who sweated to death after repeated recurrences of severe hyperidrosis, and after temporary relief from the use of Fowler's solution. As regards these reported fatal cases it must be said that it is extremely doubtful whether hyperidrosis *per se* has ever caused death.

SUDAMEN.

(Lat., *sudor*, sweat.)

(MILIARIA CRYSTALLINA. Ger., FRIESEL; Fr., MILIAIRE CRYSTALLINE.)

Symptoms.—In this disorder the lesions are thickly agglomerated, but discrete, transitory, and translucent, pin-point-sized vesicles, resembling dew-drops or seed-pearls, upon the surface of the skin, often requiring the touch to define their real character. These lesions are usually limited to certain regions of the body, as the neck, chest, or other parts of the trunk, but rather more generally develop upon the front and sides of the belly and in the iliac regions, though they may occur upon any part. They contain each a droplet of sweat, which is removed by evaporation. Their course is rapid, both in evolution and involution, and their sequelæ are exceedingly delicate desquamative flakes, the thin roof-wall, which originally covered the sweat-drops, having been lifted from the superficial stratum of the horny layer of the epidermis. They are usually preceded by an attack of pruritus.

¹ See his *résumé* of this subject in J. C. D., 1887, v., pp. 68, 113.

² Medical Press, February 25, 1886.

Three forms of sudamina have been described: (a) sudamina alba; (b) sudamina rubra; and (c) sudamina crystallina. The last named is the only form to which the term sudamen is properly applied, since it alone of the three designates a purely functional derangement of the sweat-secreting apparatus.

The first term, sudamina alba (*miliaria alba*), is applied to the lesions occurring where there is maceration of the vesicular wall and when the contents become opalescent. This form is rare. The second term, sudamina rubra (*miliaria rubra*, *miliaria papulosa*, *lichen tropicus*, "prickly heat"), is applied to inflammatory lesions which may accompany profuse sweating. These lesions are numerous, acuminate, pin-point- to pin-head-sized vesicles surrounded by a reddish halo, or papules of the same dimensions, or the two lesions commingled, almost invariably accompanied by hyperidrosis, though the latter may be absent in high temperatures. Areas of diffuse redness may develop where few of the elements of the eruption are visible. The marked tingling, pricking, and burning sensations by which they are accompanied are often in the highest degree distressing, and may solicit rubbing of the affected part, though the scratching elicited by severe pruritus is not common. Minute crusts may form after vesicular rupture. The attack may be mild or severe, and may last for a few days or for a few weeks or months, the result of continuous aggravation or of the production of new crops of lesions after each recurrence of the cause. The affection is not rarely complicated in obese individuals by all varieties of intertrigo and eczema. Sudamina crystallina are, however, the sole lesions which may properly be referred to this class of affections. These vesicles are always free from inflammatory symptoms, presenting a limpid, dewdrop-like aspect that is characteristic.

Etiology.—The disease is the result of excessive sweating, induced by any cause, as violent exercise, the elevated temperature of the summer season, flannel underclothing, vapor baths, or hot fomentations applied to the skin. It not infrequently follows the hyperidrosis of systemic debility, tuberculosis, inflammatory rheumatism, and the acute infectious fevers. The vesicles may occur as symptoms of the death-agony.

Pathology.—Robinson reports that the contents of the vesicles are pure sweat without admixture of lymphoid corpuscles. The fluid collects between the laminae of the deeper part of the corneous layer. A rupture of the wall of the sweat-duct may occur, but there may be instead obliteration merely of the sweat-pore by a sudden effusion of watery fluids toward the epidermis, that pass with moderate pressure through the wall-less sides of the pore into the spaces between the epithelial cells, where a chamber is readily formed. Török¹ found the walls of the vesicle composed purely of the corneous layer with a sweat-pore opening at the lower border of the chamber.

Diagnosis.—No difficulty can arise in making a diagnosis if the

¹ Mraček's Handbuch, Bd. i., pp. 418-422 (with bibliography).

peculiar characters of the sudamen be kept in view. All pustular lesions have different contents; all bullous lesions are larger, or are seated on an engorged base, or they lack the limpid clearness of the sudamen, because, however transparent the contents, they are mostly covered by a thicker and less transparent roof. The halo about the lesions of malaria rubra, or their rosy-pink shade, will determine their character. In varicella the lesions are chambered.

Treatment.—Only the simplest treatment is required. Alkaline and bran baths may be employed, of the temperature most grateful to the skin. Afterward the surface may be dusted with one or several of the dusting powders, such as starch, lycopodium, or boric acid, named in the Chapter on General Therapeutics. The internal treatment is that indicated by the condition of the patient.

Strophulus (“*Red Gum*”) is a term still employed by a few English writers to designate an eruption due to excessive sweating in the infant closely swaddled. Crocker states that it occurs frequently as a unilateral affection of the side most in contact with the mother’s body.

MILIARY FEVER.

(“*SWEATING SICKNESS*”; *Fr.*, *SUETTE MILIAIRE*.)

This is an epidemic disorder, accompanied by sweating and a cutaneous exanthem. Pineau¹ gives a description of the disease as it occurred in epidemic form on the island of Oléron, where of one thousand patients affected, between one hundred and fifty and two hundred perished. The eruption appeared in the form of hyperæmic maculæ, disappearing under pressure, after which there rapidly formed myriads of reddish or whitish, grouped, unequally sized, acuminate papules rising from a whitish and macerated surface. Among these papules were interspersed lesions of sudamina. The region of the face was not spared, and the conjunctivæ were occasionally affected. In the course of from two to four days pinhead- to bean-sized, varioliform but non-umbilicated pustules formed in the site of some of the papules, the contents of which disappeared by resorption, the final lesions presented being large, flat, reddish papules, the skin of the face particularly becoming reddened and swollen. In the course of from ten to twelve days general desquamation ensued, with extensive palmar and plantar losses. Relapses occurred in some cases with diffuse redness of the surface or with crops of reddish plaques, or yet again with the occurrence of furuncles. The sensations were those of myriads of needles thrust into the skin.

The exanthem was accompanied in some cases by fever. In the fatal cases death resulted from exhaustion.

Geber and other writers, however, believe that the lesions described are not peculiar to any special disease, and they deny the possibility of an independent miliary fever.

¹ Arch. gén. de méd., Jan., 1882, p. 25.

HYDROCYSTOMA.

(HYDROCYSTOMA, CYSTS OF THE COIL-DUCT.)

Hydrocystoma is a chronic non-inflammatory disorder characterized by the presence on the face of scattered, isolated, deep-seated, persistent, clear vesicles. Robinson¹ has published a report of his studies in this affection, which he first described in 1882. Reports of cases and studies of the disease have been made also by Hutchinson, Jackson, Jamieson, Rosenthal, Hallopeau, Tebel,² and others.

Symptoms.—The lesions are discrete or closely set, few or exceedingly numerous, tense, well-developed, clear, shining, rounded or oval, pin-head- to pea-sized vesicles, non-inflammatory, and never superficially seated—that is, never so near to the surface as the vesicles of miliaria—because the base of all hydrocystomata is to be found in the corium. They have no tendency to rupture spontaneously. The lesions are whitish in color, or when of greater age and size are dark bluish, especially at the periphery, some resembling boiled sago-grains. The signs of inflammation are absent; occasionally a mild hyperæmia becomes evident at the periphery of a single cyst. The contents are neutral or slightly acid in reaction, and pellucid, never changing to a yellowish hue, and when uninjured resolve in time by desiccation, leaving a short-lived pigmentation. They occur chiefly upon the face, especially the brow, cheeks, and nose, in symmetrical distribution, and may prevail for weeks or months, or disappear in cool weather. They are always accompanied by very free sweating.

Etiology.—The disease occurs almost invariably in middle-aged women, more often in those engaged as laundresses who have been sweating freely at their work, the face being simultaneously exposed to warm vapor. Men are very rarely affected. There is usually aggravation of the disorder in summer and either complete or partial relief in winter. Aggravation has been noted at the time of the menstrual period. One of Hutchinson's patients exhibited lesions on a single side of the face only. The patients seen by us have been usually of the dispensary class, and were women who worked much over the wash-tub. Hyde and McEwen³ have reported a typical case occurring in a woman past the menopause, where sweating was one of the symptoms of exophthalmic goitre. Inasmuch as the histology of the disorder demonstrated the necessity of a closing of the peripheral portion of the sweat-duct for the development of typical lesions, any factor which would lead to such closure, as by pressure about the excretory duct, must be reckoned as etiologic. Among these conditions may be mentioned scarring processes such as lupus vulgaris, favus, and variola; inflammatory disorders such as acne and rosacea, etc. In fact as the sweat-pore can be obstructed in many ways, the etiology of hydrocystoma must be regarded as complex, though seemingly simple.

¹ J. C. D., 1893, xi., p. 293.

² Annales, 1903, s. iv., iv., p. 273.

³ Amer. Jour. Med. Sci., June, 1903, n. s., cxxv., p. 1000.

Pathology.—The epidermis, hair-sacs, and sebaceous glands are in all parts normal, the papillary layers being involved only when the cyst approaches the upper part of the corium, where “a thin plate of flattened papillary body” is found above. Below, in places, the lumen of the sweat-duct is found enlarged and distended with liquid and a granular material. The enlargement in the duct begins above the coil of the gland, and usually in the lower part of the corium.

FIG. 181.



Hydrocystoma. (Howard Fox.)

There is some perivascular leucocytosis in progress here and there in the vicinity of the vessels, but this was not a marked feature in any one of the several sections examined by Robinson. The cavities of each duct were found lined with epithelial cells. Adam¹ believed the cyst to develop in the coil portion of the gland, but the finding of Robinson, that the duct immediately above the gland proper is the part involved, has been confirmed by the researches of several authorities.²

Diagnosis.—The lesions of sudamen and pompholyx are readily

¹ B. J. D., 1895, vii., p. 169.

² Cf. Jarish, *Hautkrankheiten*, Wien, 1908; Lebel, *Annales*, 1903, s. iv., iv., p. 273; Pinkus, *Derm. Zeitschr.*, 1904, xi., p. 642; Schidachi, *Archiv*, 1905, lxxxiii., p. 3 (experimental production of hydrocystoma); Török, *Mraček's Handbuch*, Bd. i., pp., 423–426 (with excellent bibliography).

distinguished by their superficial character and their situation, as they are rarely discovered upon the face. The vesicles of eczema are short lived and inflammatory. In adenoma of the sweat-glands the lesions are often painful and usually firmer and larger than in hydrocystoma.

Treatment.—The lesions can be caused to disappear by puncturing each, thus permitting the escape of the imprisoned fluid. A weak spirit lotion may then be applied, and this may be followed by the application of dusting-powders, due care being had to avoid the effective causes of the malady.

ANIDROSIS.

(Gr., *a*, privative; *ῥίδω*, water.)


(ANHIDROSIS. *Ger.* and *Fr.*, ANHIDROSE.)

This name is applied to those morbid conditions in which no sweat is secreted from the surface of the body. Hypohidrosis and oligidrosis are terms more exactly used to designate a relative, general, or partial decrease in the quantity of the sudoral fluid. Anidrosis, however, often is used to indicate the latter.

Diminution in the quantity of sweat excreted, or its complete suppression, whether general or local, may be a congenital or acquired peculiarity of the individual, or may be a symptom of several disorders, but as an idiopathic cutaneous affection it is rare. It occurs in ichthyosis, atrophy, and in those conditions in which destructive changes have taken place in the skin. It is common to many dermatoses, as, for example, psoriasis, erysipelas, and some forms of eczema; but in these the symptomatic character of the anomaly is shown by the fact that when the skin is relieved of these cutaneous troubles the function of sweat-secretion is restored. Similarly in neuralgias and certain forms of paralysis a circumscribed and temporary anidrosis may be the local expression of the nervous disturbance, precisely as in the case of the symmetrical hyperidroses. Anidrosis has been observed in association with chronic nephritis; in such relationship it is probably causal to some degree. Not infrequently individuals who do not sweat are prone to display upon the skin manifestations of an erythematous or urticarial type.

Treatment.—The measures capable of stimulating the sweat-secretion are: ingestion of water in quantity by the mouth, the external application of heat in a dry or moist atmosphere, and the use of jaborandi or pilocarpine by the mouth or by hypodermatic injection. In the anidrosis accompanying cutaneous disease the indication is always primarily for the relief of the latter.

BROMIDROSIS.

(Gr., βρωμος, a stench; ὕδωρ, water.) (BROMIDROSIS, OSMIDROSIS, FETID OR STINKING SWEAT. *Ger.*, STINKENDER SCHWEISS; *Fr.*, BROMIDROSE.)

Symptoms.—In bromidrosis¹ the perspiration is effused in such a state that immediately it can be perceived to possess an unusual odor, or, as Hebra taught was the case with the majority of patients, to be rapidly changed to that condition. It is often associated with hyperidrosis, but may occur independently of the latter, and like the latter also be either general or localized. The odor may be either agreeable or disagreeable, having been in various cases compared to that of certain flowers and fruits as well as to that of several stench-emitting animals. In this respect the sweat presents a striking analogy to the urine, with which it sustains a close and well recognized physiological relation.

General bromidrosis may be physiological, as in the case of individuals of the African race, or in those with dark skins who are profusely sweating during labor or in high temperatures. General pathological bromidrosis is rare. The odors emanating from the person in ulcerating syphilodermata, small-pox, malignant pemphigus, mycosis fungoides, and other disorders may, in certain cases, be associated with the sweat-secretion, but in other cases they doubtless are connected with the decomposition of pathological products of the inflammatory process.

The local varieties of bromidrosis affect the regions in which the sweat is oftenest secreted in excess and its immediate evaporation prevented, as in the axillæ, the groins, the feet, the ano-genital, and the intermammary and inframammary regions. In a qualitative sense every degree of odorousness is noted, from that which is merely slightly disagreeable or offensive to the most intolerable stench. When complicated by a seborrhœa, in situations where the parts are not only warm, moist, and covered by clothing, but also subject to friction and remaining uncleansed, the most intolerable and nauseous fetor is perceived. As in hyperidrosis, there may be coincident or resulting redness, swelling, and even vesiculation or superficial inflammation of the region where the symptoms chiefly are declared.

Etiology and Pathology.—The use of strongly smelling drugs such as valerian, asafoetida, musk, etc., has been known to produce odorous perspiration; a similar observation can be made regarding certain foods (onions, garlic) and drinks. It is occasionally due to emotional causes,² to chronic alcoholism, or to the gouty state. Systemic diseases, such as diabetes, Asiatic cholera, typhoid fever, typhus, dysentery, scurvy, septicæmia, and pyæmia, may impart peculiar odors to the perspiration. Neurasthenia and dietetic errors

¹ Cf. Monin, "Sur les Odeurs du Corps Humain," Ann. d. l. Soc. de Méd. d'Anvers, Paris, 1885. Abstr. J. C. D., 1885, iv., p. 211.

² Cf. Hammond, N. Y. Med. Rec., 1877, xii., p. 460.

(meat-eating in excess, alcoholism, etc.) may be responsible for the affection at almost every age and in individuals of either sex. In a mild form it is common in vigorous brunette women soon after the puberal epoch and during menstruation. In bromidrosis of the feet Thin¹ has recognized micro-organisms (*Bacterium fœtidum*) in sweat obtained; Parkes concludes that the only cause of the disease is the covering of the foot, as soldiers with uncovered feet do not suffer from this affection. The fact is patent to every observer that sweat may be effused in a normal condition upon and within the articles of clothing worn, and subsequently generate a stench by chemical changes both in the clothing and the fluid by which that clothing is saturated.

Treatment.—The treatment of bromidrosis is in general that of hyperidrosis, already described. Internally sodium salicylate has been employed with success in 5-grain (0.33) doses. The regulation of the diet, and especially the disuse of alcohol and tobacco, are essential to the management of some cases, and the general health of the patient should always receive attention.

Locally the indication is to remove and cleanse frequently the clothing of the part, and to make antiseptic and astringent applications. Formalin solutions in the strength of from 1 to 10 per cent. in alcohol are of the greatest value. They should be followed by the use of boric acid in powder externally. Thin² successfully employed stockings and cork-soles thoroughly dried after being saturated for hours in a jar containing a solution of boric acid. The efficacy of this antiseptic measure he ascribes to the fact that the odor is the result of the development of *Bacterium fœtidum* in the secretions. An ointment is also employed by him for similar purposes; it is a solution of boric acid in glycerin incorporated with a fatty basis of white wax and almond-oil, making thus a "glycerated cream of boric acid." Clement Hawkins³ finely triturates 15 grains (1.) of red lead oxide, and to this adds gradually 1 ounce (30.) of Goulard's extract. This preparation is used as a lotion following a nightly foot-bath containing 1 ounce (30.) of alum. Radiotherapy is also efficient.

Fox⁴ advises a 1 per cent. solution of chloral or of potassium permanganate as a topical application. Chromic acid solutions in 5 to 10 per cent. strength, and potassium permanganate solutions in the strength of 1 part to 1000, may be employed. An efficacious procedure is the nightly bathing of the feet in a saturated solution of boric acid, followed by a thorough rubbing with alcohol; the feet are then dusted with a powder containing equal parts of boric acid and tannoform, with an addition of 2 per cent. of salicylic acid. If desired tannoform may be used alone, or talcum, or magnesium carbonate may be added to the combination. It must never be forgotten in

¹ Brit. Med. Jour., 1880, xviii., p. 463.

² Practitioner, December, 1881, xxvii., p. 2101.

³ Brit. Med. Jour., May 7, 1881.

⁴ Brit. Med. Jour., May 7, 1881.

the management of any case that the coverings of the parts affected must receive careful attention; treatment can be only partially successful if this point is neglected.

CHROMIDROSIS.

(Gr., *χρῶμα*, color; *ὕδωρ*, water.)

(EPHIDROSIS TINCTA, COLORED SWEATING, STEARRŒA NIGRICANS, PITYRIASIS NIGRICANS.)

By this term is indicated the condition in which effused sweat exhibits an abnormal color—yellowish, reddish, greenish, bluish, or blackish. CYANIDROSIS and MELANIDROSIS are terms which have been employed to indicate blue and black sweating. The perspiration may be effused upon the surface already colored, or it may develop color by oxidation in the air, or it may be commingled with substances which produce the abnormal color upon the surface of the skin (bacteria, dyes, chemical agents in themselves without color). The term PSEUDOCHROMIDROSIS is used by some to designate those forms in which after secretion the color is produced by the action of micro-organisms.

Symptoms.—The most usual location for chromidrosis is the region of the eyes, especially the lower lids. Adjacent portions of the face may be involved by extension. The condition occurs less frequently in the axillary, crural, and genito-urinary regions, and has been observed upon the breast, back, and hands. Melanidrosis is the most common form, the predominating color presenting a variable admixture of brown or blue hues. Cyanhidrosis stands next in order of frequency, often modified by brown or yellow tints. The pigment material is removable with considerable difficulty, imparting to the cloth used a distinct smudgy stain. Oil rather than water facilitates the cleansing process. The color may be diffuse or the fine amorphous particles of pigment may be grouped so as to give a punctate appearance to the part involved. In certain forms the hairs participate in the dyschromia. Hyperidrosis is not necessarily present. Whether the sweat is effused rapidly or slowly, the intensity of the color of the area obviously becomes greater with the accumulation of pigment. Subjective symptoms are practically absent.

Etiology and Pathology.—Any age¹ and both sexes may be affected but the subjects of the disorder are usually women of a neurasthenic type, and in view of the admitted rarity of chromidrosis the suspicion of dissimulation not infrequently arises. While it has been observed repeatedly in vigorous individuals, it is commonly found that the patient's general health is below par. Pelvic disorders in women have been noted in many cases.² We have observed chromi-

¹ Le Roy de Méricourt, first to name the disorder, describes a case of rosy sweating in an infant. Arch. gén. de Méd., November, 1857, and Bull. Acad. de Méd., 1884, 2^e s., xiii., p. 425.

² N. Y. Med. Jour., 1903, xxvii., p. 26.

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drosis with simultaneous hair coloration following the excitement of good news. Residence near the sea is credited with some predisposing tendency. An instance of red sweating is reported by Temple,¹ in a patient who was taking potassium iodide for syphilis. Greenish sweating, due to the presence of copper in the system, has been reported.² We have observed one case of this disorder in which the effect was produced by the copper plate of an electrode in contact with an abraded surface of the skin. Authors have attributed the color of the sweat to the presence of compounds of phosphorus, iron, cyanogen, hematin, chromogen, and indican in the secretion. In the case of the last named substance there is reason to believe that in many cases of cyanhidrosis, the indican is excreted in the colorless form (white) and changes to blue on the surface of the skin as the result of exudation.

At the meeting in 1881 of the American Dermatological Association we exhibited the hairs of a middle-aged man that had changed in a night from grayish-white to a greenish and yellowish brown hue. White, of Boston, has observed similar cases of hair coloration as the result of profuse sweating. It is possible in these instances that the chromidrosis is produced by the mechanical washing of pigment to the surface by the outpouring sweat. In the case reported by Prentiss³ of a young woman affected with an acute purulent cystitis, whose hair, under the influence of profuse sweating induced by the action of pilocarpine, changed speedily from a light blonde to nearly jet black hue, a similar explanation might hold were the possibility excluded of a color change due to the excretion in the sweat of indican-forming substances absorbed from the focus of suppuration in the bladder.

The red and yellow forms of chromidrosis are believed to be due for the most part to the presence of bacteria. In ten patients who came under our observation, five of them women, the sweat was pale-red to blood-red in color; the axillæ were the regions involved. In all the cases the microscopical examination revealed similar changes. The hairs of the axillæ were thin, pale-red, brittle, and surrounded with a colloid-looking, rusty or bright red sheath, in places of considerable thickness and having a rough surface. This sheath consisted of red masses presenting a radiating striation, more or less confluent, apparently proceeding from fibres of the cortex of the hair, or from some broken part of its surface. The radiating striations were found to be due to the aggregation of round or ovoid bacteria which were united in zoöglea masses by a reddish intermediate substance. Nodular swellings on the hair were produced by infiltration of the organism between the separated fibrils. The roots of the hair were free from bacteria. The red tint of the sweat was found to depend upon the numerous roundish masses of zoöglea.

¹ Brit. Med. Jour., 1891, Aug. 29, p. 477.

² Clapton, Med. Times and Gazette, 1868, p. 658.

³ Phila. Med. Times, 1881, xii., p. 385.

Trommsdorff¹ found a yellow and a red bacterium in a case of red sweating of the armpits. He believes that microorganisms are always present in these types of chromidrosis, and that they should be regarded as special forms of *Lepothrix* (*Trichomycosis palmellina*—Pick). He is of the opinion that microorganisms will ultimately be found to be causally related in some instances to cyanhidrosis.

Under the title "*Seborrhea Nigricans*," Mitchell² describes an unusual case of chromidrosis in which there was a dark greasy-looking discoloration of the eyelids and adjacent skin. The relation of the sebaceous glands to the disorder is as yet not determined. In a case reported by Barrie³ the palms of the hands (free of sebaceous glands) were affected. In Heidingsfeld's case⁴ the sweat glands were normal and the sebaceous glands were absent in the part involved (left forearm).

In all cases, before accepting statements of patients as to the existence of symptoms of this character, it is needful to eliminate the possibilities of deceit and accident. Coloring matters received upon the hands may be transferred either wilfully or ignorantly to the surface of the body. Hall⁵ reports several cases in which supposed cyanidrosis was found to be due to cheap black stockings, the dye of which when brought in contact with acid sweat produced a peacock blue discoloration of the toes.

Treatment.—The treatment of chromidrosis is that of the general state of the patients exhibiting the symptoms. Attention should be directed to the gastro-intestinal tract with a view of preventing excessive indol formation. Locally where a parasitic source is suspected antiseptic measures may be employed.

URIDROSIS.

(Gr., *οὔρον*, urine; *ῥόδον*, water.)

(*Ger.*, HARNSCHWEISS; *Fr.*, URIDROSE.)

Uridrosis is that condition in which some of the constituents of the urine, chiefly urea, are excreted in excess with the sweat.

While a small amount of urea is to be recognized in normal sweat, this ingredient under peculiar conditions may be increased, and, together with urinary salts, be deposited upon the skin-surface after evaporation of the exuded fluid. Such symptoms have usually occurred either as the result of grave constitutional affections (such as cholera), or of organic renal diseases accompanied by anæmia, or of the ingestion of jaborandi. In a few cases the symptoms have been presented in individuals who were apparently in good health. The

¹ Münch. med. Wochenschr., 1904, July 19, p. 1285 (with bibliography).

² Phila. Med. Jour., 1898, i., p. 117.

³ Annales, 1889, s. ii., x., p. 937, with bibliography.

⁴ J. A. M. A., 1902, xxxix., p. 1519, with bibliography.

⁵ B. J. D., 1902, xiv., p. 418.

salts of the urine appeared upon the skins of these patients in the form of minute lamellæ, or of a fine powder of whitish color and crystalline aspect. In some cases reported the symptoms have been noted to precede by a few days a fatal issue.

The constantly adjusted equilibrium between the sweat-secretion and the urinary excretion would explain, for cases of a mild type, temporary augmentation in the urea found in the sweat of unusually free diaphoresis. Geber supposes that decomposition-products, such as ammonium carbonate, possibly in association with volatile fatty acids, may in part account for these conditions.

In the effort to eliminate certain substances accidentally or purposely introduced into the system the sweat may possibly become charged with iodine, turpentine, tar, arsenic, and other substances. Several of the eruptions described in the chapter on *Dermatitis Medicamentosa* are due to a similar eliminative effort, especially those accompanied by excessive sweating and the production of vesiculation. In the same manner it may be inferred that the sweat is at times charged with excrementitious and other products of the body; as, for example, the elements of the bile. In patients affected with yellow fever the skin and even the sweat which exudes from it often exhibit the characteristic hue of that disease. The so-called *Galactidrosis*, from supposed metastasis of milk, does not occur; cases thus described have been instances of pathological sweat in the puerperal state.

Phosphoridrosis,¹ in which a phosphorescent quality has been imparted to the sweat secretion, is reported in rare cases to have resulted from ingestion of phosphorescent fish, and in such wasting diseases as pulmonary tuberculosis, tabes, and scurvy.

Hæmatidrosis (*Hemidrosis*, *Sudor Sanguinea*, *Bleeding Stigmata*, *Neurotic Excoriations*, *Bloody Sweat*), reported as observed by several authors (Foot, Ebers, Parrot), is the name applied to conditions in which blood has been seen to exude from an unbroken skin. The phenomena described under this title belong properly to the ensemble of symptoms called "hæmophilia," and may in some cases be due to direct transudation of red and white blood-corpuscles and fibrin into the interepithelial spaces traversed by the sweat-pores. In a case macroscopically examined by Török red corpuscles were found in the lumen of the coil portion of the sweat-gland.² Geber points to the neuralgic, hyperæsthetic, pruritic, or emotional symptoms that are usual precursors to the flow of pale or bright-red blood. The fact that patients thus affected are mostly women, hysterical, dysmenorrhœic, or near the puberal epoch, also throws light upon these cases; in many of them petechiæ, or signs of hemorrhage into other tissues of the body, are observed. It may occur obviously in any acute affection presenting purpuric symptoms.

¹ See Mercks' case, *Wien. klin. Wehnschrft.*, 1903, xvi., p. 1091.

² Mraček's *Handbuch*, Bd. i., pp. 416-418 (with bibliography).

The bleeding may occur from a single point, or from several in succession, or simultaneously from multiple stigmata. There may be a precedent elevation of the surface forming vesicles, blebs, macules, or papules; or the skin at the site of the hemorrhage may be unaltered. Gangrene has resulted in a few instances. Often pain or other sensations announce the occurrence of the bleeding.

Special caution is to be taken lest patients complaining of these symptoms solicit the hemorrhage by self-injury. In a few cases the persistence of the sanguineous flow has induced a dangerous anæmia. The treatment is that indicated by the conditions present.

HYDRADENITIS SUPPURATIVA.

This disorder was described in 1864 by Verneuil, and since then many writers have recorded different disorders under the same name while other observers have described similar cases under different titles. The disorder under consideration is essentially a suppurative inflammation involving the sweat apparatus. Some cases of *Folliclitis* have been included in these descriptions on account of involvement in these cases of the sweat glands.

Symptoms.—In the disorder under consideration, the common sites for the lesions are the regions of the axillæ, anus, nipples, scrotum, and labia majora. In these parts the lesions may be single or multiple. They may attack other regions but avoid the palms and soles. The lesions resemble indolent furuncles without pilosebaceous involvement. Occasionally several of the nodules coalesce and form a flat tumor with a number of openings. The disorder is chronic.

Etiology and Pathology.—As predisposing causes should be counted all conditions, general or local, which tend to lower the vitality of the tissues. The origin is unknown, though it is probably to be sought in local infection or in the action of some toxic agent excreted by the coil-glands.

The process has been shown to be a diffuse inflammation of the coil-glands and periglandular tissue, usually terminating in necrotic suppuration and destruction of the gland. Primarily the coil epithelium undergoes changes which are responsible for the cellular infiltration of the peripheral tissue. No microorganisms have been recognized in the cases examined.

Treatment.—The general condition of the patient should furnish the indications for treatment of each case. Locally the nodules should be opened and dressed antiseptically. The disease is stubborn but eventually terminates in recovery.

GRANULOSIS RUBRA NASI.

The above title was given by Jadassohn¹ to a peculiar affection of the nose in children. This nomenclature is accepted to-day, but

¹ Archiv, 1901, lviii., p. 145.

the disorder has been described under other headings as: "A peculiar form of acne with changes in the sweat-glands" (Luithlen); "Perisyringitis chronica nasi," and "Dermatitis micropapulosa erythematosa hyperidrotica nasi" (Jadassohn); "A peculiar inflammatory dermatitis of the nose of young individuals with sweating" (Herrmann); "False acne rosacea in children" (Audry); "A form of chronic erythema of the nose in children" (Dubreuilh). Since first described by Luithlen in 1900, the number of reported cases is constantly increasing.¹

Symptoms.—The disease is a chronic inflammation of the skin covering the cartilaginous portions of the nose, and is characterized by a more or less sharply defined area of redness on which are scattered irregularly, without definite arrangement, pin-point to pin-head-sized, dark-red macules and papules. Interspersed among these lesions are beads of perspiration; often the rounded papules are tipped with a droplet of sweat. The hyperidrosis of the nose is a striking feature of the disease, and there is in some cases a coincident hyperidrosis of the face and hands. Occasionally vesicles are found containing a clear droplet of fluid; when these are large and deeply seated they are not to be distinguished from the lesions of hydrocystoma. The redness of the area involved ranges from pale-pink to a purplish hue; the color of the lesions fades on pressure; the nose is cold to the touch, and subjective symptoms, aside from slight itching, are absent. There is usually to be found evidences elsewhere of impaired peripheral circulation.

Etiology and Pathology.—The patients are usually children ranging in age between six months and sixteen years. A few cases have been reported in adults. Both sexes are about equally affected, the individuals being for the most part delicate children with poor circulation. Hereditary influences have been traced in some instances.

The histological changes are those of inflammation, situated in the corium. The superficial blood-vessels are dilated; about them and also the sweat-ducts is an infiltration consisting of leucocytes, connective-tissue cells, plasma cells, and occasional mast cells. A few leucocytes may be found in the dilated interepithelial lymph spaces of the rete. The pilo-sebaceous follicles are usually normal. If the infiltration about the sweat-duct is marked, a cyst of the proximal portion of the duct may be found, as in hydrocystoma.²

The essential factors in the production of the disorder are not positively recognized. It is probable that vascular disturbances are the primary elements in causation. Hallopeau³ regards the disease

¹ For report of cases and discussion of the disease in general see: Audry, *Jour. Mal. Cut.*, 1903, xv., pp. 809-811; Baumer, *Derm. Zeitschr.*, 1904, xi., p. 640; Mirolubow, *Deutsch. Med. Zeitung*, 1906 Nos. 62-63; Malherbe, *Jour. Mal. Cut.*, 1906, xvii., p. 96; Pick, *Archiv*, 1902, lxii., p. 105; Herman, *Archiv*, ix., 1902, p. 77; Leget, *Annales*, 1903, s. iv., pp. 273-282; Pinkus, *Derm. Zeitschr.*, 1904, xi., p. 642; Macleod, *B. J. D.*, 1903, xv., p. 197, and *ibid.*, 1906, xviii., pp. 342-353 (excellent resumé); Ormsby, *J. C. D.*, 1905, xxiii., p. 183.

² Lebet, Pinkus, *loc. cit.*

³ XV. International Medical Congress, Lisbon, 1906. *Ref. in Derm. Zeitschr.*, 1906, xiii., p. 573.

as a neurohyperidrosis due to disturbances of the vaso-dilators and vaso-constrictor nerves.

Diagnosis.—The disease has been mistaken for lupus vulgaris because of the gross appearance of the papules. In the disorder under discussion the lesions disappear under pressure, there is no tendency to ulceration, and marked hyperidrosis is present. From acne vulgaris and rosacea it may be differentiated by the absence of involvement of hair follicles and sebaceous-glands.

Treatment.—Treatment is usually not very effectual. The general health should be improved by proper hygiene and the exhibition of indicated internal medication. Locally astringent powders, lotions or pastes containing resorcin, salicylic acid, ichthyol, etc., may be tried. Tannoform as a dusting powder has been used with considerable success. Relief by these applications is usually temporary, but complete disappearance of the disease may be looked for when the patient attains maturity.

THE SEBACEOUS GLANDS.

SEBORRHŒA.

(*Lat., sebum, tallow; Gr. πῆω, to flow.*)

(STEATORRHŒA, ACNE SEBACEA, DANDRUFF, SEBORRHAGIA, SEBACEOUS FLUX, STEARRHŒA. *Ger.*, SCHMEERFLUSS; *Fr.*, SÉBORRHÉE.)

The clinical phenomena which should be included under the title "Seborrhœa" are at present in dispute. Since the time that Unna first placed under the caption, Eczema Seborrhoicum, a number of conditions which had previously been classed with Seborrhœa, the tendency has been toward a constant increase in the former category at the expense of the latter. This tendency is due in part to an over-emphasis of histology as a basis for the classification of skin diseases. While it is unquestionably true that the microscope will often discover the evidences of inflammation where clinically no signs of that condition are manifest, it would seem best for the present, until our knowledge of the factors concerned becomes more accurate, to make the basis of classification in this instance clinical rather than histological. Under Seborrhea, therefore, will be described those conditions which are non-inflammatory as far as is evidenced by the clinical appearances. Those seborrhœic disorders which clearly show the signs of inflammation are considered under Dermatitis Seborrhoica.

It must be borne in mind that this classification is somewhat arbitrary and is chosen with a purpose—to make as clear as possible to the student an obscure portion of dermatology. It does not assert that, histologically, traces of inflammation cannot be demonstrated in

the disorders described, nor does it fail to recognize that clinically a simple seborrhœa may become distinctly inflammatory under proper conditions of irritation.

Symptoms.—Seborrhœa occurs in two forms. According to the condition of the excreted product, they are described as seborrhœa oleosa and seborrhœa sicca. These two forms are recognized clinically as of separate occurrence, yet the dividing line between them is not clear-cut, since the oily form, by inspissation and crusting of the excessive secretion present, may pass clinically into the dry variety.

Seborrhœa Oleosa.—This form of seborrhœa, variously known as hyperidrosis oleosa (Brocq), seborrhœa simplex (Unna), stearrhœa simplex (Wilson), *acné sébacée fluente*, etc., is in its pronounced features rarer than seborrhœa sicca, but in lesser degree it is a condition sufficiently common. The sebaceous secretion is exuded as an oily fluid upon the surface both of the hairy and so-called “non-hairy” parts of the skin. In the former situation, both in adults and infants, the free oily substance is seen to cover as a coating both skin and hairs, and especially in adults who have suffered much loss of hair as a result of the sebaceous disorder, to produce a glistening and shining appearance of the scalp. In women with long hair the locks are often matted together in a glue-like paste. The same greasy layer can be seen over the non-hairy portions of the skin, especially about the nose, forehead, and cheeks. Free drops of oil can occasionally be wiped from such surfaces with a handkerchief. The ducts of the sebaceous follicles here are either patulous or plugged with sebum; the skin-surface may be slightly reddened or be pallid, but it is usually cold to the touch. The oily substance serves to entrap particles of dust, soot, etc., floating in the air; thus a peculiarly dirty or even blackish hue of the face is often produced. This form of seborrhœa, though most common on the face and scalp, may occur on the chest, the back, the pubes, the genitals, and rarely on the other parts of the body. In the negro, in whom the sebaceous glands are usually well developed and active, the oily form of seborrhœa is common, and the flux at times is practically physiological. Subjective symptoms in seborrhœa oleosa are usually slight, though a moderate amount of itching is commonly present.

Seborrhœa Sicca as the term is generally accepted, varies greatly in its manifestations, but in general its features may be divided into the scaling and the crusting form of the disease. The scaling form, variously known as seborrhœa furfuracea or pityriasiformis, pityriasis simplex, eczema seborrhoicum, eczema squamosum, etc., is most common on the scalp, in which region it is popularly known as “dandruff.” Seborrhœa capitis in its commonest form is recognized in the adult by the formation on the scalp, of fine, branny, slightly greasy, white or grayish scales, which may be so abundantly shed as to fall freely and cover the shoulders of the patient whenever the hair is brushed or otherwise disturbed. At other times these fatty scales are more or less adherent to the scalp-surface, or are piled up in

laminae one upon another. These scales may mat the hairs to the scalp or be disseminated through the mass of the hair, some of the hairs penetrating a flattened greasy scale, as a twig might be passed through the centre of a leaf. In consequence of their deprivation of unguent the hairs to which the affected glands are accessory become dry and lustreless. Some degree of alopecia is invariably present; this fortunately is usually symmetrical.

The affection may be circumscribed, and in conspicuously exhibited patches covered by scales; or it may extend uniformly over the entire surface of the scalp, or, as is frequently noticed, may fringe the brow at the line of the hairs and then extend chiefly over the vertex, being conspicuous at the line where the hairs are parted from vertex to brow. Beneath the scales or crusts of dried sebum the scalp is usually lustreless and a slate-gray color. The disease not infrequently extends from the scalp to the adjacent portions of the face, neck, and ears. In these situations the skin may be slightly reddened, while the scales are thin, adherent, and not very abundant. The eyebrows, the region covered by the beard, and the pubic hairs may be affected, although less frequently, in the manner described above. In the latter region the itching is often more severe than when limited to the scalp. The disorder may appear on the portions of the face more distant from the scalp, and on other parts of the body, in the form of dry, roughened patches which scale more or less, but which are only slightly, if at all, reddened. On any of these surfaces the condition may shade insensibly into those described under dermatitis seborrhœica.

The crusting forms of seborrhœa may occur on any of the hairy or non-hairy parts of the body, but are most common on the scalp and face. The so-called "waxy" form is represented by the physiological vernix caseosa of the newborn infant, and by the more or less adherent dirty-yellowish cap often long surviving upon the vertex of young infants. Occurring later in infancy, the disease is known as "milk-crust," or as *crusta lactea*. This may merely be persistence of the dried vernix caseosa about the vertex in the newborn, or it may occur in scalps which have been perfectly cleansed after birth. The crust differs somewhat in color with the tint of the child's complexion, and may vary from a light yellow to a dark brown; it may be thick, greasy, and mat the hairs; or be thin, dry, and friable. Inflammatory complications are very prone to develop from decomposition of the material making up the crust, in which event the disorder becomes properly a dermatitis seborrhœica. The region of the brow, the surface covered by the beard of the male, and the pubic hairs may be involved in this type of the disease, though less frequently than in the furfuraceous form.

On the face this form of seborrhœa is characterized chiefly by the accumulation of thick, dirty-yellowish and even yellowish-black accumulations of sebaceous matter, often adherent to the surface and disfiguring the features by the mask produced. This condition is

conspicuous about the nose, where the disease is at times symmetrically disposed. The crusts once removed, the skin beneath is generally found to be pallid or slightly reddened, with the orifices of the sebaceous ducts patulous; while the under surface of the separated crust is seen to project downward in corresponding delicate prolongations comparable to stalactites. The crusts rapidly reform when the disease is not arrested. They are found in the furrows on either side of the nostrils, on the brows, the cheeks, and the pavilion of the pinna of the ear. They are most common at the puberal epoch in both sexes when the sebaceous glands of the skin undoubtedly sympathize with the changes occurring at the beginning of the sexual life.

Seborrhœa may affect the eyelids, in which situation a mild dermatitis seborrhœica usually supervenes, owing to the trauma of rubbing and the incessant movement of the skin in winking. The lids are then reddened, slightly swollen, and in various degrees covered with minute crusts (less frequently with scales). The eyelashes often fall and in cases of long standing their loss may be permanent owing to atrophy of the follicles.

Seborrhœa of the umbilicus assumes special features in that the fatty matters in this region are remarkable for their tendency to speedy decomposition, with the production of an exceedingly fetid odor and a mild degree of seborrhœic dermatitis.

Seborrhœa of the genitals in men is usually located in the sulcus behind the corona glandis though in individuals with a tight or a redundant prepuce it may become more extended. In women the accumulation occurs about the clitoris and vestibulum, though the external labia may be covered with the secretion in various degrees of fluidity. The smēgma preputii supplied by the glands of Tyson may thus be a source of trouble either by its retention, or by its secretion in abnormal quantity or quality. In either event the tendency is to decomposition, fetid odor, and subsequent irritation, which may lead to an inflammation of severe grade.

Seborrhœa Squamosa Neonatorum (*Ichthyosis Sebacea*).—This condition in the newborn is probably not a seborrhœa. The body at birth is covered with a greasy layer not unlike paraffine paper in appearance; beneath, the skin has a varnished, reddish-brown appearance. Owing to the stiffening of the integument fissures are prone to develop, and these about the mouth may lead to malnutrition from inability to take the nipple. The layer tends to renew itself in part after removal, but eventually the desquamation ceases and the skin becomes normal. Bowen¹ regards the condition as a persistence of the epitrichial layer of the embryo which is normally cast-off *in utero* at the seventh month.

In adults the disease may occur in marasmic subjects and in old people in the form of a persistent fine scaling on the trunk and extensor surfaces of the limbs, and is known as "Pityriasis Tabescentium." A yet rarer form is described by Kaposi under the name of "Cutis

¹ J. C. and G.-U. Dis., 1895, xiii., p. 485.

1890 a smēgma facelle
Very like that of tubercularis.

Testacea," in which large portions of the skin, especially the extensor surfaces of the limbs, are covered with greenish-brown or blackish crusts which are more or less broken up into plates.

Etiology.—Seborrhœa, except that form which appears in infancy, is most frequent at the age of puberty or in young adults—that is, at the time of greatest activity of the glands. It may appear, however, at any age. It occurs about equally in both sexes. The commonest seats of the disease are: the scalp, the face, the genital region, the dorsum of the body between the scapulæ, and the anterior surface of the chest; all of these are regions where the oil glands are especially numerous and well developed. Seborrhœa oleosa is found more frequently in persons of dark complexion, while seborrhœa sicca is more common in blondes. A family tendency to furfuraceous seborrhœa of the scalp, with the resulting alopecia, may often be noted.

Among the predisposing causes may be counted all systemic disturbances which lower the vitality and general nutrition. Seborrhœa may thus follow acute infectious diseases, and frequently appears during the course of chronic exhausting diseases, such as syphilis or tuberculosis. Constipation, indigestion, sedentary habits, and the excessive use of alcohol and tobacco, may be classed as predisposing factors. The disease occurs, however, in individuals who are apparently in excellent health. Among the local predisposing causes are the wearing of stiff, heavy, and ill-ventilated hats, and the failure properly to care for the scalp. Women with long hair are generally obliged to bestow special attention upon the scalp. Men with short hair attend chiefly to its disposition upon the head, and because this is so easily accomplished often neglect the care of the scalp. Such neglect is followed frequently by seborrhœa sicca when no other cause for the disorder can be found. Both varieties of seborrhœa are frequently found, often with inflammatory complications, in nuns with whom the scalp, ears, and neck are encased snugly in stiff, unventilated head-dresses.

While there is much, both in clinical experience and in laboratory findings, to commend the theory that seborrhœa is of parasitic origin, no one microorganism has yet been demonstrated to have a definite etiological relation to the disease. Moreover, the sebum retained in the follicles furnishes an excellent culture-medium for an unusual development of microorganisms which may be found on the scalp in normal conditions. Schamberg¹ has demonstrated Sabouraud's microbacillus in the follicles of individuals having no signs of seborrhœa or of other diseases of the sebaceous glands.

Pathology.—Although the pathology of diseases of the sebaceous glands, including seborrhœa, comedo, acne and acne rosacea, has been studied by many competent observers, there yet exists a diversity of opinion regarding the nature and pathogenesis of these affections. The conservative view, based on the teachings of Hebra, is that sebor-

¹ J. C. D., 1902, xx., p. 99.

rhœa is a functional disease of the sebaceous glands, manifested in hypersecretion of pathologically altered sebum, and often accompanied by some hypertrophy of the glands. In the oily form, the sebum is secreted in excessive quantities and may be more fluid than normal.

As a rule at puberty, and in some individuals throughout their lives, the quantity of oily sebum excreted is larger than usual, and it is not always possible to draw sharply dividing-lines between the physiological and the pathological process. In the dry form of seborrhœa the secretion is dryer than usual and mixed with cells exfoliated from the ducts of the glands and hair-follicles, and with imperfectly metamorphosed cells from the glands themselves. Unna¹ believes that the skin is lubricated by oil from the coil-glands, and that in seborrhœa oleosa (which he terms *hyperidrosis oleosa*) the secretion is practically all furnished by them, the sebaceous glands being involved if at all secondarily. Beatty² states that the coil-glands do not furnish the oily secretion in this condition. Sabouraud³ concludes that seborrhœa oleosa (also comedo, acne, and alopecia areata) is due to an inflammation of the sebaceous glands, caused by a definite micro-bacillus which is found within a cocoon-shaped mass of epithelium at the neck of the follicle.

It is generally believed that the coil-glands secrete fat, but how much they supply and what part they play in seborrhœa are unsettled questions. The fact that seborrhœa is most frequent and most pronounced in regions where the sebaceous glands are largest and most numerous is fairly good evidence that these glands more than the sweat-glands are active in the production of the disease.

In seborrhœa sicca the scales are produced from the horny layer of the scalp and not from the gland. This fact was demonstrated by Hardaway in 1878, and since that date by Unna, Sabouraud, and others, and is an argument that the disease is essentially inflammatory. Sabouraud states that simple pityriasis of the scalp is due to a flask-shaped bacillus and to a coccus producing gray cultures. The lesions with greasy scales he thinks are the result of superficial inflammation, added to preëxisting seborrhœa oleosa. Unna finds in seborrhœa sicca several microorganisms (see *Dermatitis Seborrhoïca*) which he believes to be the cause of the disease.

Unna and Elliott state that the microscope shows inflammation to be present in all but the simple oily form of seborrhœa. As stated before it is difficult to draw sharply dividing-lines between the types here described which clinically show little or no evidence of inflammation, and the distinctly inflammatory forms described as *dermatitis seborrhoïca*.

Diagnosis.—Seborrhœa is to be distinguished from eczema, dermatitis seborrhoïca, ichthyosis, impetigo, psoriasis, syphilis, and tinea tonsurans. The distinctly inflammatory character of the first two

¹B. J. D., 1894, vi., p. 257; and *Histopathology*, p. 222.

²Brit. Med. Jour., 1901, ii., p. 858; and *Les Maladies du Cuir chevelu*, Paris, 1902.

³B. J. D., 1894, vi., p. 161.

serves to differentiate them. In ichthyosis, the scale is dry and non-greasy; the disease is congenital, usually involving the entire body, while seborrhœa is generally acquired and is rarely universal. Crusting impetigo of the scalp might be confused with seborrhœa; the former is an acute disease, its lesions are comparatively small, circumscribed, and isolated, the crusts differ in character from the sebaceous matter formed in seborrhœa, and the skin beneath is reddened and evidently the seat of an exudation. Psoriasis of the scalp may be recognized by the presence of typical patches upon the body; the scales are lustrous, larger, and not greasy unless some fatty application has been made to soften them; they cover a reddened integument beneath; and alopecia is not produced even in persistent cases. Some of the pustular syphilodermata located upon the scalp and face, if observed only in the stage of crusting, might be confounded with seborrhœa; but the history of the case, the discovery of other signs of syphilis, such as adenopathy, mucous patches, etc., the character of the secretion, the condition of the surface beneath the crusts, and the small size, more definite outline, and characteristic grouping of the lesions should point to the identity of the disease. Tinea tonsurans may be recognized by the non-greasy character of the scales upon the affected patches, which are usually circumscribed and circular; the hairs in the areas involved are fragile and often appear as broken off stumps, in which the presence of the parasite is shown by the microscope.

Treatment.—The general and internal treatment of seborrhœa should be varied to meet the requirements of the individual case. The preparations most often indicated are: iron in anæmic young women, cathartics in sluggishness of the bowels, and cod-liver oil and the bitter tonics when there is impairment of nutrition. Arsenic, employed in the manner suggested by Sir Erasmus Wilson, is praised by Hebra:

R	Vin. ferri,	f3jss;	45
	Liq. potass. arsenit., }	āā f3ij;	8
	Syrup. simpl., }	f3ij;	60 M.
	Aq. destill.,		
Sig. A teaspoonful to be taken three times daily with the meal.			

In many cases the acid iron mixture of Startin, or some modification of it, admirably meets the indications.

R	Magnes. sulph.,	5ij;	60
	Ferri sulphat.,	3ss-3j;	0.66-1 33
	Acid. sulph. dilut.,	f3ij-f3iv;	8-16
	Infus. quassie,	ad f3iv;	120 M.
Sig. A teaspoonful in water, to be taken through a tube after eating.			

Throughout the treatment the physician should insure a careful observance of the laws of hygiene. Sunlight, nutritious food, and open-air exercise are not to be disregarded. When the scalp is involved the patient should be encouraged to discard the hat so far as

possible, consistently with the circumstances in which he may be placed, and thus promote the favorable action of light and air upon the part affected. In cases in which it can be tolerated, daily cool salt-and-water sponging of the entire body-surface, followed by brisk friction, as described under the treatment of acne may be employed with great advantage.

The first indication to be met by local treatment in seborrhœa is the removal of the crusts and the fatty matters accumulated upon the surface. It is always well to warn patients, especially if the disorder be upon the scalp in an aggravated form and occur in young women with apparently luxuriant tresses, that a considerable loss of hair will result. Many of the hair-filaments are so impoverished by the disease and so loosened in their follicles that a complete cleansing of the scalp-surface will bring the hairs away in quantities sufficient to threaten speedy baldness; and it is not rarely the case that patients attribute this to the treatment rather than to the disease. The fatty accumulations are first to be soaked with some oily fluid to facilitate their removal; for this purpose olive-oil, vaselin, almond-oil, glycerin, or lard is usually employed. The substance selected should be used in quantity sufficient to permeate all crusts. It may be poured over or be rubbed into the scalp several times in the twenty-four hours, and at night a flannel or other cap should be worn. In the case of children and infants gentleness is required in thus treating the scalp, especially in the subsequent washings, lest the surface be irritated. In women it is rarely necessary to cut the hair. As soon as the soaking with oil is complete the crusts are to be removed by washing with soap and water, though when the accumulations are bulky, masses may be gently removed with the fingers or a comb. When the scalp is tender, ordinary toilet or Sarg's glycerin soap may be applied with warm water; but it is usual, in the case of adults, to employ the well known tincture of green soap. The surface should be thoroughly sponged with the tincture, and then warm water added until with gentle rubbing, lather is abundantly produced over the scalp, when an excess of water is finally used to cleanse the part of crusts, oil, and soap. The scalp and hairs are then thoroughly dried and anointed with some bland, fatty substance if the exposed surface be tender and irritable; if not, with some stimulating pomade or lotion.

In cases in which milder effects are required the scalp may be washed with water containing such alkaline substances as borax, ammonia, or potassium carbonate. The popular prejudice against these articles is based upon the abuse of strong alkaline lotions in the hands of inexperienced persons. Such lotions may readily be tested by the tongue before use upon the scalp. They should in all cases be followed by an oily or greasy application medicated to meet the requirements of the case. Tar soap may be used at times with advantage for cleansing the scalp; the compound tincture of green soap of the National Formulary (1906) is a preparation so medicated and may be applied in the same manner as the simple tincture.

Though seborrhœic crusts may be extensive, it is possible to remove them completely in every case by the measures described above, and with the first treatment patients are often delighted. Not infrequently their disappointment is correspondingly great when they discover that the seborrhœa is not at an end, and that in the course of a few days the fatty plates are as freely as ever deposited on the scalp, disseminated through the hairs, and showered upon the shoulders. Some will even declare that the soapy applications aggravate the disorder by increasing the seborrhœa. It should, therefore, never be forgotten that, having disposed of the extraneous matters accumulated upon the surface, there is still to be remedied a functional disorder of the sebaceous glands of the part.

In every case, then, after the use of soap and water, which may be repeated as often as need be, daily, at intervals of several days, or once a week, the scalp is to be thoroughly anointed. For this purpose olive-oil, cod-liver oil properly scented, almond-oil, vaselin, or glycerin and water may be used. Van Harlingen recommends, as a substitute for other oils, the *oleum sesami* (oil of benne), since it does not dry and clog as do the former. An ounce (30.) of this oil rubbed up with 5 grains (0.33) of powdered benzoin, and digested for three hours over a water-bath, with the addition of 3 drops of absolute alcohol, and filtered, furnishes an excellent basis for oily mixtures to be used on the scalp. Any of these applications can be made conveniently with a medicine-dropper. Crocker advocates the use of a lotion containing acetic acid, prior to the application of oily preparations to the scalp, the object being to aid the penetration of the remedy.

In the place of oils after these ablutions, pomades are often used with more advantage. For this purpose vaselin, lanolin, lard, and cold cream ointment furnish the best bases. To obtain the desired consistency, any one of these may be used alone or in combination with the others or with an oil.

Of the many substances employed and recommended as medicaments for these pomades, sulphur, resorcin, salicylic acid; and the red oxide, the red sulphuret, and the ammonio-chloride of mercury are most serviceable.

Sulphur is of great value in the treatment of all sebaceous gland disorders; in the form of an ointment, 15 grains (1.) to a drachm (4.) to the ounce (30.) of vaseline or other ointment-base. One-half the quantity, or as much, of resorcin may often be added with advantage to the pomade. The alterative effect of the mercurials is also as evident in seborrhœa as in many other cutaneous disorders. At the head of the list, for this special purpose, stands the red mercuric oxide in strength of from 2 to 4 grains (0.133–0.266) to the ounce (30.) of ointment; but ammoniated mercury, and calomel in the proportion of from 5 to 10 grains (0.33–0.66) to the ounce (30.), may be often substituted for the former with advantage. The tars are useful in many obstinate cases; *oleum rusci* may be added in the

strength of 1 to 10 parts to any of the salves recommended above. Ichthyol in ointments of the strength of from 5 to 10 per cent. has also proved efficacious. An excellent formula for the scalp is the following:

Rx	Sulphur. præcipit.,	5j;	4
	Lanolin.,		
	Glycerin.,	aa 3ijss;	10
	Aq. rosæ,		
	Saponis,	℥ss;	66 M.
Sig.	Ointment for scalp.		

Lotions are well adapted to some cases; they are cleanly and easy of application, and are more pleasing to most patients, especially to women with long hair. Their efficacy is often enhanced by the addition of a small amount of oil. Mercuric chloride is admirably adapted for use in lotions; so also are tincture of cantharides, capsicum, nux vomica, and the salts of quinine. A good formula is as follows:

Rx	Resorcin.,	3ijss;	10
	Hydrarg. bichlorid.,	gr. ij;	133
	Ol. amygdal. dule.,	3ij;	8
	Tinct. cantharid.,	3ij;	8
	Spts. vin. rect.,	3ij;	60
	Aq. destill.,	q. s. ad f 3vj;	180 M.
Sig.	To be rubbed into the scalp.		

For this may be substituted $\frac{1}{2}$ ounce (15.) of resorcin in 2 ounces (60.) of alcohol and 6 ounces (180.) of rose-water.

Often the combined use of a pomade and a lotion is advantageous. A convenient procedure is to have the patient shampoo the scalp once a week; after the hair is dry a pomade suitably medicated is applied with the finger tips, and on each of the intervening six days before the next shampoo a lotion is employed upon the scalp with the aid of a medicine-dropper.

Repeated applications and patient care of the scalp are necessary to secure complete relief in the case of a disease as essentially chronic as seborrhœa. At times the local treatment may be changed with advantage. Not infrequently too vigorous treatment is followed by a more or less acute dermatitis. In this case stimulating preparations should be replaced by soothing ointments or lotions until the induced inflammation has subsided.

The treatment outlined above for the hairy portions may be used with success also for the relief of seborrhœa of the non-hairy portions of the body, especially the face. Here, it will be observed, the crusts have a tendency to re-form, and the most persistent treatment is necessary to secure permanent relief. Occasionally, after cleansing the surface with soap and spirit-lotions according to the indications of each case, it is of advantage to apply the ointment selected for subsequent application, not only by gently smearing it on the parts with the tips of the fingers (always the most effective

method), but also by spreading it on a compress, which, for the night at least, may be fixed in contact with the part. Unna's lead-plaster mulls, used for this purpose in Germany, may fairly well be imitated by drawing strips of cheesecloth through heated diachylon ointment and then smoothly smearing them with the same material. When the tendency to re-formation of the crust is abated one or more of the dusting-powders may at times be employed with advantage for the purpose of protecting the skin or of exercising upon it an astringent effect. Sulphur and salicylic acid are especially valuable in these dusting-powder combinations.

Seborrhœa oleosa is best treated with lotions or with powders. Should the skin become irritated under these applications, ointments may be substituted for a time. Astringent lotions or powders containing tannin, zinc sulphate, zinc oxide, bismuth subnitrate, sulphur, salicylic acid, tannoform, etc., are often serviceable.

The local treatment of seborrhœa of the genitals is somewhat different. Ointments rarely answer well in disorders of the mucous surfaces, and green soap is too irritating for similar employment. Here washing with a good toilet-soap and warm water is sufficient for the purposes of cleanliness, and diluted lotions containing alcohol, in the form of whisky, brandy, or aromatic wine, suffice. These lotions can be made astringent with tannin, alum, or zinc sulphate, and when there is pain or tenderness opium may be added. In this form of the disease, as also in seborrhœa of the umbilicus, carbolic acid or chlorinated soda may be necessary to correct fetor. After the employment of these lotions boric acid with talc (1 part to 4), or zinc oxide (1 part to 8), may be dusted over the part.

In the condition described as ichthyosis sebacea in the new born the body must be kept anointed with oils or fats. Artificial feeding may be demanded by the condition of the mouth.

Prognosis.—In forming a prognosis in cases of seborrhœa of the scalp it must be remembered that the disease is frequently obstinate, and shows a decided tendency to recur unless some treatment be continued for weeks or months after the scalp is apparently well. The resulting loss of hair, if symmetrical, may be remediless, but much may be done in the way of saving the hair which is left. Facial seborrhœa is much more amenable to treatment; seborrhœa of the genitals and the umbilicus is an entirely manageable disease.

DERMATITIS SEBORRHOÏCA.

(ECZEMA SEBORRHOÏCUM.)

Duhring was the first observer to show that a type of inflammation of the skin, to which he gave the name seborrhœa corporis, was closely allied to, and usually consecutive to, seborrhœa capitis. Later, Unna¹ advanced the theory that a single morbid process, to which

¹ Monatshefte, 1887, vii.; and Histopathology.

he gave the name, *eczema seborrhoicum*, is responsible for a number of varied clinical manifestations which had previously been considered separate disorders. Under this title he includes seborrhœa sicca (or pityriasis) of the scalp, face, and body, some chronic circumscribed forms of eczema, and many cases which most observers still believe are forms of psoriasis. In America Elliott has furnished an excellent presentation of the subject.¹

Though Unna gave *eczema seborrhoicum* a wider range than is accepted by the majority of dermatologists, there is little doubt that the most of the phenomena he describes under that title are intimately related etiologically and pathologically. It must be said that the tendency to-day is toward his position, though it is doubtful if his views in their entirety will ever attain full acceptance. Following Unna, the term, by many authorities, is made to include certain seborrhœic disorders which are non-inflammatory in the sense that the clinical signs of inflammation are absent. These same disorders, however, may show histologically, distinct though perhaps slight, evidences that the pathological process is inflammatory. It is manifestly not easy to mark accurately the dividing line between the inflammatory and the functional in these instances without the aid of the microscope. As the term itself implies an inflammatory complex the expedient course would seem to be to make the division between seborrhœa and *eczema seborrhoicum* purely clinical; in other words, to place in the former group those disorders which show no clinical sign of inflammation, reserving for the latter group those which are manifestly inflammatory.

Many of the conditions described under *eczema seborrhoicum* arise from the implantation of an inflammation upon an ordinary seborrhœa, as the result of some form of external irritation. Prominent among these exciting factors must be mentioned the decomposition of the excessive sebaceous secretion upon the uncleansed or improperly cleansed skin; but it cannot be denied that any dermatitis produced by whatever irritant, may, in individuals with a tendency to functional disturbances of the sebaceous glands, take on a seborrhœic character. This fact viewed in the light of the present-day conception, that the difference between *eczema* and *dermatitis* is largely etiological, argues in favor of a change in nomenclature from *eczema seborrhoicum* to *dermatitis seborrhoica*.

The *eczema seborrhoicum* of Unna, therefore, narrowed by the eliminations of clinically non-inflammatory forms, is here described under the name *Dermatitis Seborrhoica*.

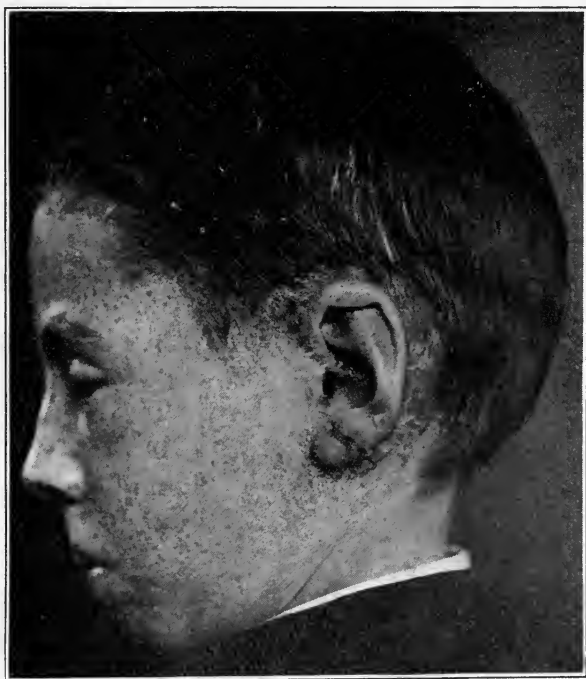
Symptoms.—*Dermatitis seborrhoica* almost invariably begins on the scalp and often remains limited to this region, though frequently it extends to the ears, temples, forehead, neck, and adjacent parts. The disease is not uncommon on other parts of the body where the sebaceous glands are large and abundant, as in the sternal, interscapu-

¹ Morrow's System, iii., p. 273.

lar, inguino-scrotal, axillary, and umbilical regions. It may appear, however, on any part of the body and in rare instances is universal. The disease is extremely variable in its course and mode of extension. It may remain confined to the scalp for years and then extend to adjacent surfaces, or appear on portions of the body distant from the scalp, leaving the intervening surfaces unaffected. Such spreading of the disease may be very rapid, or so slow as to be almost inappreciable, while the lesions may be numerous, extensive, and acute in type, or few, scattered, and indolent in character.

The affection varies considerably in appearance in its different phases and especially in different regions. In the scaly form, which is the most common, there is a scanty or abundant formation of fine branny scales; the skin is somewhat reddened, and often has the peculiar yellowish color which is characteristic of the disease. The scales may be large and abundant, and heaped up in dry, adherent

FIG. 182.



Dermatitis seborrhoica.

masses, simulating those sometimes seen in psoriasis, but in such cases the scales are usually somewhat fatty. Frequently there is a coëxisting seborrhœa oleosa, with the formation of yellowish to brownish, soft, greasy, and non-adherent masses, suggesting crusts rather than scales, under which the skin is more or less reddened and the mouths of the follicles patulous.

The disease often appears in the form of oval or rounded macules and patches, or as small scale-capped papules which may remain discrete or may coalesce to form slightly elevated plaques. The macules, papules, and plaques are sharply outlined, and patches that are spreading peripherally frequently present a circinate border with a fading yellowish centre. By the coalescence of several such areas polycyclic, gyrate bands may be produced. The color of the lesions

FIG. 183.



Dermatitis seborrhoica.

is reddish or pinkish, modified by the yellow tinge that is nearly always present. Scaling and crusting in varying degrees are usually present as in the more diffuse forms described above. The lesions may occasionally be moist over all or parts of their surfaces, but the characteristic vesicles and pustules of eczema are absent and the discharge when present is usually distinctly greasy. Of the varied manifestations of the disease the scaling forms are the most common, but in a given case the type may change gradually or rapidly, and multiplicity of lesions is not unusual. Itching is usually slight and may be absent.

On the scalp the onset of the disorder is particularly insidious and often unnoticed until attention is attracted to it by a thinning of the hair, moderate or really annoying pruritus, and a scanty or abundant formation of scales over more or less of the scalp. In the early

and mild forms the condition is practically that described under *seborrhœa sicca*; the point of emergence from the latter condition into a *dermatitis seborrhoica* is here considered as marked by the appearance of the clinical characteristics of inflammation. The vertex is the usual site of the affection, but the entire scalp may be involved. The scales may appear in any of the forms described above, but are usually fine, dry, grayish, and slightly greasy. The lowest layers of the scales are usually firmly attached to the underlying surface, which at first dry, lustreless, and pale, becomes more or less hyperæmic. After the condition has existed for a time alopecia is noticed, while the hairs of the affected regions are dry and lustreless. The condition may persist for months or years with but slight change. In more severe forms the heavier masses of scales and crusts described above may occur upon distinctly reddened or moist patches. *Seborrhœa oleosa* may complicate the process with its characteristic greasy crusts and oily condition of scalp and hair. Itching is usually quite severe, and the inflammatory features of the condition are aggravated by the trauma of scratching. In infants and occasionally in adults a genuinely acute dermatitis may supervene, involving portions or all the scalp and usually extending to the adjacent portions of the face. The condition known as *MILK-CRUST* (described under *Seborrhœa*) passes into a form of *dermatitis seborrhoica* when inflammation is produced by irritation from decomposition products in the material accumulated upon the scalp. In adults circumscribed, oval or circinate, reddened, and scaling, moist, or crusted patches may appear, chiefly at the nape of the neck and about the temporal and parietal regions, often extending to the ears and portions of the face. Occasionally a sharply defined red band, more or less covered with scales or small crusts, may be seen at the margin of the hair, especially on the forehead and on the neck. Such bands closely resemble those of psoriasis, but usually have a more regular and even outline, much less infiltration and thickening of the skin, and lack the characteristic scales and outlying separate lesions of psoriasis.

The ears and the surfaces surrounding them are, after the scalp, more frequently involved than other parts of the body. Any of the above-described types of the disease may be seen in this region, the moist and crusting forms being quite common, especially back of the ears, where fissures frequently occur. The disorder not rarely affects to a very marked degree the lining of the external conduit of the ear, blocking it with crusts and interfering seriously with audition.

The beard, moustache, eyebrows, and pubes may present symptoms differing but slightly from those in the scalp. The disorder may linger about the verge of the moustache or other parts of the beard, showing its grease and scales even at a distance from the line of hairs, with a well-defined reddened surface beneath. The same occurs about the line of the eyebrows. Alopecia is uncommon in any of these regions except the eyebrows.

On the face the pityriasic forms with a moderate degree of redness are common on the nose and adjoining portions of the cheeks, the eyebrows and the region between, the eyelids and their margins, and may be exhibited on any part of the face. The more inflammatory moist and crusting types are most frequent along the junction of the alæ of the nose with the cheeks, but may involve the entire nose and other parts of the face. The macular and papular types, above described, are most common on the cheeks.

Seborrhœa Corporis.—Upon the trunk is frequently found Unna's "flower-leaf" or "petaloid" type of the eruption which was first described by Duhring and to which have been assigned by different authors the titles *seborrhœa corporis*, *seborrhœa papulosa* or *lichen-oïdes* (Crocker), *lichen circumscriptus* (Willan), *lichen annulatus et serpiginosus* (Wilson), and flannel-rash. Its favorite sites are the sternum and interscapular region, but rarely it spreads in more extensive areas on other parts of the trunk. In a well-marked case the lesions appear in the form of sharply outlined circles or segments of circles which enlarge centrifugally, often coalescing to form patches with irregularly circinate outlines. The extreme borders, which represent the early stage of the lesions, are made up of very small red papules, usually covered with fine, whitish or yellowish, dry or fatty scales. As the border progresses the centre undergoes involution, so that from without inward the patch may display varying shades of red, brown, and yellow, while the whole surface is often the seat of a furfuraceous desquamation. Round or oval, somewhat elevated, solid lesions are frequent, and may scale slightly or be covered with yellow, greasy crusts. In less perfectly developed cases and in those modified with friction of the clothing or frequent bathing, there may be simply yellowish, finely scaling patches with slightly reddened, more or less irregular borders.

The eruption also occurs upon the trunk and extremities in the form of macules, papules, and reddened patches which by coalescence of individual lesions may become quite large. These lesions may present any degree of scaling or crusting, though there is usually a narrow, uncovered reddened margin. The affected areas may be dry; and in form, distribution, and general appearance closely simulate psoriasis; or they may be somewhat moist and, as a result of irritation or of excessive exudation, may undergo a transformation to a condition indistinguishable from that of eczema. In most cases the yellowish color of the lesions is conspicuous, being most marked when the eruption is fading. While the dorsal surfaces of the hands and feet may be involved it is very doubtful if seborrhœic dermatitis ever affects the palms and soles.

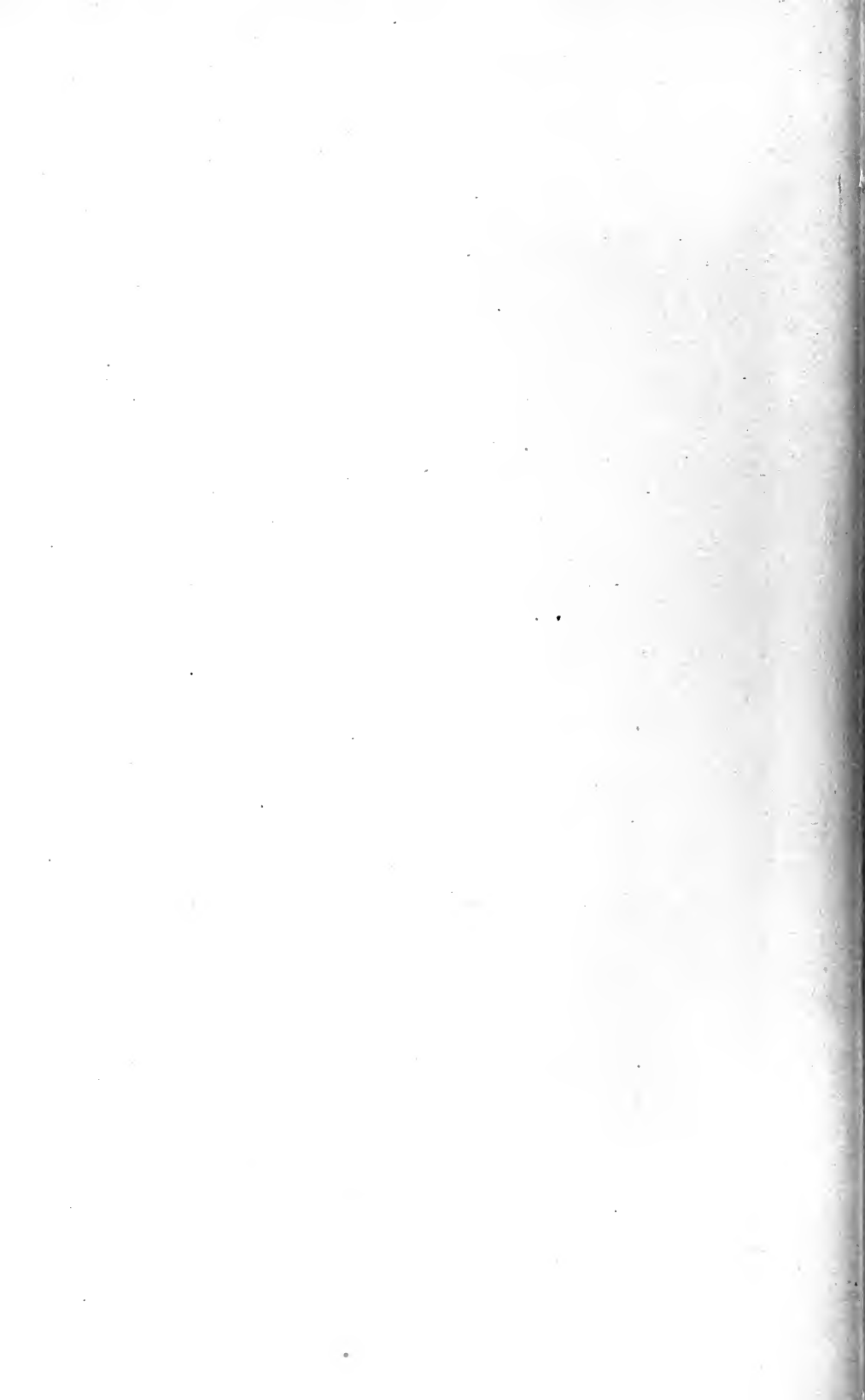
In the axilla and groin the eruption often begins as an erythema intertrigo, and owing to the influence of heat, moisture, and friction in these regions secreting patches are common. From these points the disease often spreads to the adjoining surfaces, the advancing

PLATE LI



Photo by Oram.

Dermatitis Seborrhoica. (Stopford Taylor.)



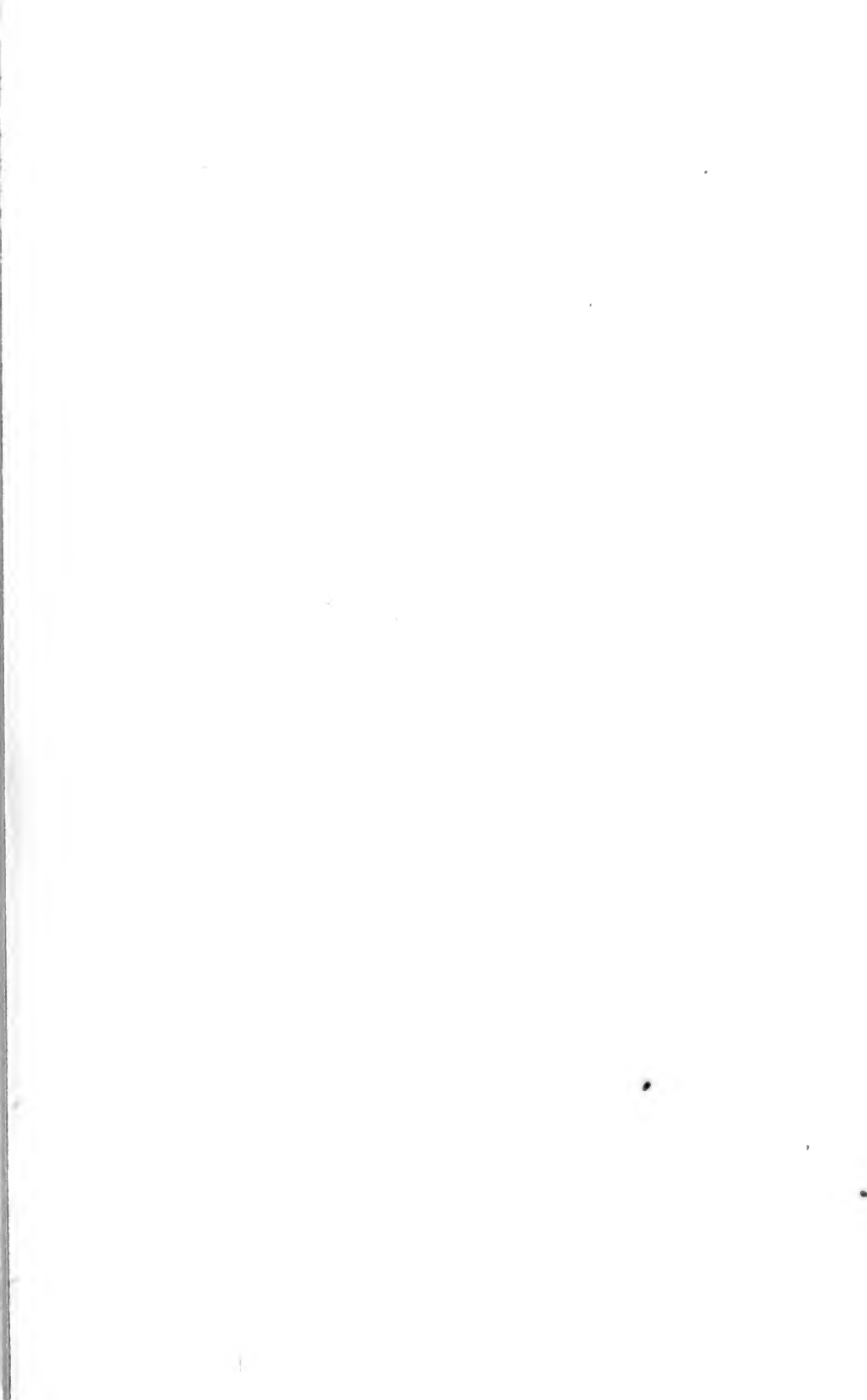


PLATE LII

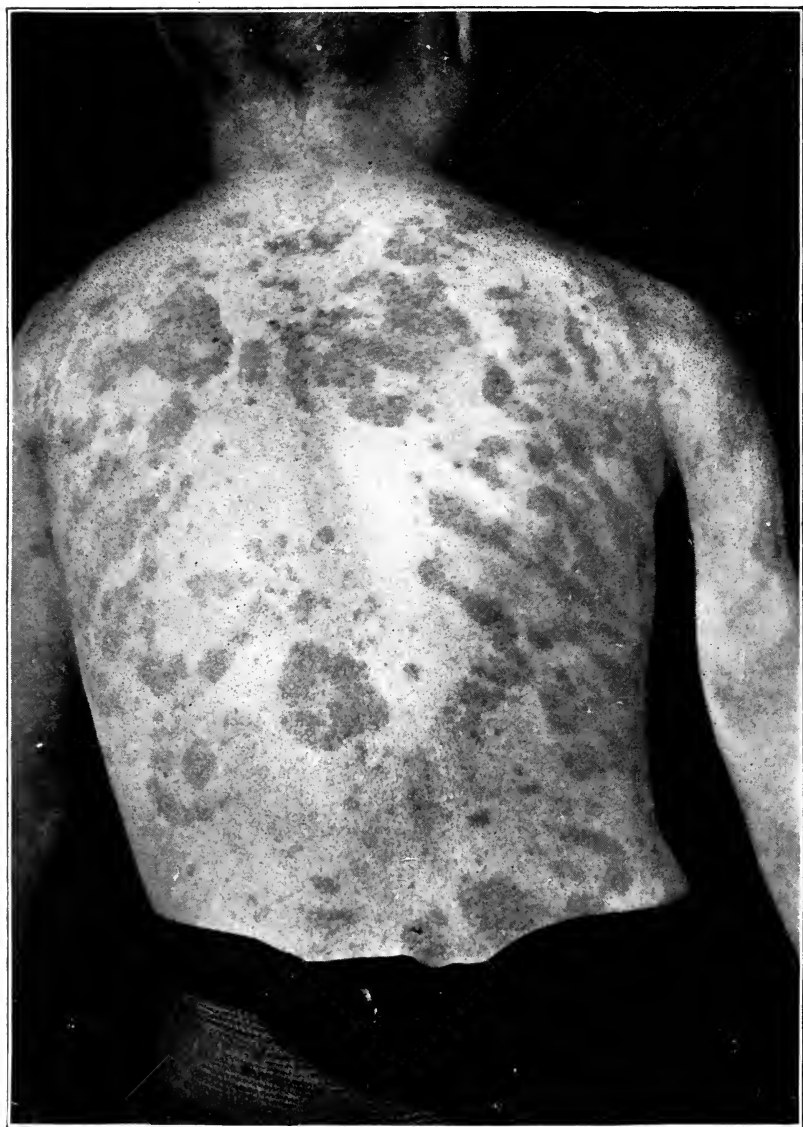


Photo by Oram.

Dermatitis Seborrhoeica. (Stopford Taylor.)

margin of the eruption always being sharply outlined and usually of circinate contour.

Etiology.—In his first description of eczema seborrhoicum Unna claimed for it a parasitic origin. He has described three varieties of diplococci which he found in the lesions of this disease, beside several varieties of bacilli which were occasionally present. Of these he considered a mulberry-shaped coccus, which he called the *Morococcus*, of special importance, and on occasions has produced with it, by the inoculation of pure cultures, one or more vesicles, but without reproduction of a patch of true eczema seborrhoicum. He also found Melassez's flask-shaped bacillus in the scales.

Elliott¹ reports on a bacteriological study by W. H. Merrill, of fifty cases of eczema seborrhoicum. In all but two cases, on which a solution of resorcin had been freely used, bacteria of some kind were found. Merrill describes two varieties of diplococci and a bacillus, all three of which were present in thirty-one cases, while one or two of them were found in most of the remaining cases. Twelve inoculation-experiments were made, of which seven were successful; from pure cultures of the cocci typical lesions of the disease were produced, from which, in each case, the special coccus was recovered and cultivated. One of these cocci was decided to be chromogenic and the cause of the yellowish color characteristic of the disease. These experiments, though too few in number to be conclusive, would seem, when considered in connection with clinical evidence, to leave little doubt of the parasitic origin of the disease. The etiological value of the micro-bacillus of Unna and Sabouraud is considered in the discussion of Seborrhœa. Positive evidence of the transmission of the disease from one individual to another is difficult to get, though a history of probable contagion is obtained frequently.

Locally, heat, moisture, friction, and other forms of irritation may act as predisposing causes and favor the origin and spread of the disease. On the body it is often found in those who perspire freely and who wear woollen next the skin. On the scalp it is common in those who keep the head covered much of the time. Elliott reports that most of his cases occurred in people who lived for the most part indoors, and that the affection is unusual among those who live largely in the open. His explanation of the greater prevalence of the disease in winter than in summer is that in the former season most people live indoors, with poorer ventilation, and bathe less than in summer.

The systemic conditions favoring the development of the disease are practically those named as predisposing causes of seborrhœa.

Pathology.—Even in the mildest grades of the affection, corresponding to the condition known as pityriasis capitis, Elliott² found "slight inflammatory infiltration about the papillary vessels and the

¹N. Y. Med. Jour., 1895, lxii., p. 528. A subsequent report by Merrill, *ibid.*, 1897, lxx., p. 322, confirms these findings.

²Morrow's System, iii., p. 282.

ascending branches from the subpapillary plexus, and along the hair-follicles," while in the rete there were some vacuole-like formations in the basal layer, and a few wandering cells. In severer grades the inflammatory infiltration extended to the subpapillary plexus, and in higher grades to the entire cutis, which was then somewhat œdematous. In the rete, vacuoles were numerous and their origin could be traced to a nuclear degeneration. Many wandering cells were present, also karyokinetic figures and areas of cell-degeneration. The horny layer was thickened and easily detached from the interfollicular spaces, but densely packed in the dilated openings and necks of the follicles. The sebaceous glands were apparently normal. The coil-glands in many instances were dilated and contained cast-off epithelial cells mixed with a granular débris, while mitosis and cell-degeneration were seen frequently. Elliott found no appearance that would warrant him in believing the coil-glands to be the source of the fatty hypersecretion. Unna, on the other hand, found fat in the coil-glands, and believes them to be the source of most of the fatty secretion characteristic of the disease. He also describes an infiltration of small, free globules of fat through all parts of the cutis and rete, inside the lymph-sacs. Elliott found no evidences of such infiltration; but Ledermann announces that he has recognized it in normal epithelium.

Unna and Elliott agree in considering all stages of the process an inflammation of a catarrhal nature, the immediate cause of which is to be found in one or more specific microörganisms. (See also *Seborrhœa*.)

Diagnosis.—From other forms of dermatitis and from simple eczema, dermatitis seborrhœica may be distinguished by its origin on the scalp, its oily secretion and crusts, the yellowish color and sharp outline of its lesions, its tendency to spread peripherally in circinate outlines, and by its lack of marked subjective sensations.

In some forms of the disease the diagnosis from psoriasis is difficult, but the location of the lesions on the flexor rather than on the extensor surfaces, the oily character of the scales and crusts, the yellowish color, the greasy and scaly centre of circinate lesions undergoing involution, and the general course of the eruption, will usually suffice to distinguish the disease.

Pityriasis rosea may present appearances similar to those of dermatitis seborrhœica of the trunk and extremities. The lesions in the former disease, however, do not appear on the scalp, usually have ill-defined, frayed-out borders, and the enlarging rings present a dry, fawn-colored centre which is free from greasy scales. The affection, moreover, runs an acute course, rarely lasting more than six or eight weeks.

Lupus erythematosus occurs chiefly upon the face; it is rarer upon the scalp and body. The scales of lupus are tenacious and dry, and require scraping for their removal; the contour of the lesions is well defined, and scars are produced as the condition resolves. Erythema-

tous lupus is far less amenable to treatment, and persistency of lesions after a faithful trial of the remedies usually effective for seborrhoic dermatitis should always suggest a reconsideration of diagnosis. This fact holds especially true of lesions upon the scalp.

Tinea circinata often appears upon the face, and might be mistaken for seborrhoic dermatitis; but the tendency to clear in the centre as the margin advances, the distinct elevation of the active edge, and the discovery of the fungus will establish the diagnosis. The same criteria hold for *eczema marginatum*, in which the trichophyton invades the crural region; in this, however, the fading of the central portion is less pronounced than in ringworm elsewhere and more dependence must be placed on the well-defined, elevated, advancing margin, and the demonstration of the organism.

Treatment.—Sulphur, resorcin, salicylic acid, white precipitate, and other preparations of mercury are remedies most useful in the treatment of all stages of the disease. For the earlier and dry forms, stronger and more stimulating preparations may be used, together with more frequent washings of the skin, than in the acute, moist forms, which must be treated more in accordance with the principles laid down for the treatment of the corresponding stages of *eczema*. For the scalp and other hairy portions of the body lotions are usually better than ointments. The lotion recommended by Elliott, containing 3 to 20 per cent. of resorcin in equal parts of alcohol and water, is one of the best, and should be applied two or three times daily. For the dry forms of the disease a small amount of oil—preferably the oil of sweet almonds—to prevent the disagreeable drying effect of the lotion alone, may be added. Instead of thus combining the oil with the liquid, a thin ointment containing resorcin or sulphur may be substituted for or applied after the lotion. After soap-and-water washings, which should be used often enough to prevent accumulation of scales and crusts, an oily or fatty application is always desirable.

The most serviceable ointment in the majority of cases is one containing from 1 scruple to 2 drachms (1.33 to 8.) of sublimated or precipitated sulphur, 10 minims (0.66) of balsam of Peru, and 1 ounce (30.) of vaselin. Instead of sulphur, resorcin or white precipitate may be used. In some chronic cases with much infiltration, sulphur, resorcin, and salicylic acid may with advantage be combined in the same ointment, while in a few instances the tars, pyrogallol, or chrysarobin may succeed after the above-named preparations have failed. In acute forms, in which the symptoms are more those of an acute *eczema*, pastes and ointments containing salicylic or boric acid are valuable until the acute inflammatory condition has subsided, when preparations containing sulphur or resorcin should be used.

The disease is usually more amenable to treatment than *eczema*, though recurrences are common.

ASTEATOSIS.(Gr., *a*, privative; *στέαρ*, fat.)(XEROSIS. *Ger.*, ASTEATOSE; *Fr.*, ASTÉATOSE.)

Asteatosis is that condition of the skin in which there is absolute or relative deficiency of the sebaceous secretion.

Symptoms.—Insufficient lubrication of the skin by its natural unguent may be either general or partial, and occur as an idiopathic or a symptomatic disorder. It is produced artificially by any agents which continually withdraw the fatty substance from the skin-surface, as in those trades necessitating the constant immersion of any part of the body in strong alkaline solutions or in waters strongly impregnated with calcium and potassium salts. As an idiopathic affection it is of rare occurrence, but it is not an infrequent accompaniment of other local or constitutional diseases, such as psoriasis, lepra, xeroderma pigmentosum, ichthyosis, and lichen ruber. In these cases the skin becomes dry, often thickened and indurated, and, as a consequence, friable, and prone to desquamation, fissures, and chaps. To the touch, the absence of sebaceous secretion is noticeable in the objective sensation produced. Asteatosis is a well-marked feature of the marasmus of old age. Some authors have described under this title the dry thickening and induration of the palm of the hand accompanied by curving of the fingers toward the plane of their flexor tendons, a condition that is occasionally to be observed in laundresses.

Treatment.—No internal medicaments are known to have the power especially of stimulating the sebaceous secretion. None, indeed, could be capable of having such action when, as is often the case in the disorders characterized by asteatosis, there has resulted an atrophy of the sebaceous glands. For external application of an artificial unguent, cod-liver oil, almond-oil, lanolin, palm-oil, vaselin, lard, or butter may be employed. Vaseline is in many cases to be preferred, as the other articles named are liable to become rancid after oxidation, and thus act as irritants. Elliott prefers liquid albolene or benzol. With such partial or general lubrications, however, a warm bath of soap and water should be ordered every second or third day; immediately after the bath the inunction may be repeated.

Prognosis.—In all cases in which the asteatosis is induced by agents operating externally upon the surface a reasonable hope of recovery may be entertained after withdrawal of the cause. Persistence of the latter is liable to be succeeded by the occurrence of eczema or dermatitis medicamentosa. A complete cure can scarcely be expected when this condition is a symptom of one of the disorders already named.

MILIUM.

(Lat., *milium*, a millet-seed.)(GRUTUM, STROPHULUS ALBIDUS, TUBERCULUM SEBACEUM, ACNE ALBIDA. *Fr.*, ACNÉ MILIAIRE.)

Symptoms.—Milia occur upon and about the eyelids, the cheeks, the forehead, the temples; the penis, scrotum, and corona glandis of men; and the internal face of the labia minora of women. They are millet-seed- to pinhead-sized, pearly-white, occasionally symmetrically placed, globoid masses, rarely attaining the dimensions of a coffee-bean, showing within the epidermis as though portions of kernals of rice were lying immediately beneath a translucent layer of tissue. They occasionally project from the surface to such an extent as to resemble small-sized vesicles having milky contents. In color they are yellowish and whitish. They are often congenital, and can be recognized about the lids and temples of the newborn infant; they are also seen, however, in middle life, when they develop very slowly, and sometimes persist for years. They occasion no subjective sensation, and are commonly so insignificant as to induce no deformity. They never degenerate by ulcerative processes, but when not artificially removed, in the course of years are exfoliated in the natural processes of physiological desquamation. In rare instances the deposition within the milia of the salts of lime renders them as hard as cartilage (Cutaneous Calculi). They are usually larger than the small-sized lesions and of a more yellowish hue.

Etiology.—Milia may be of embryonic origin and occur in the newborn; they are common in infancy and early adult life, and are rare in middle life, though occasionally developing after the thirtieth year. They are at times produced mechanically; the stroke of a knife-blade, accidentally or in the processes of surgery, separating one or more of the acini of a sebaceous gland from the main body. The contracting bands of a cicatrix, after destruction of tissue from any cause, may operate in a similar way with precisely the same result, and they may thus follow the lesions of tuberculosis, syphilis, erysipelas, and pemphigus vegetans.

Pathology.—When a milium is incised externally a spherical body of nearly corresponding size may be expressed, though it may require tearing from a minute pedicle below, which represents the attachment to the hair-follicle. The small mass thus extracted is seen to be a horny cyst composed of several thin envelopes, suggesting the capsules of the onion and representing cornified epithelia which have not undergone fatty metamorphosis, and in the centre of which is a fatty nucleus. There is never any lobular formation. Each of these horny cysts is developed in connection with the lanugo hair-follicles, distending the latter, as Unna has shown, irregularly and on one side. The process represents a hyperkeratosis of the epithelium of the hair-follicles, though it is believed by some that the milium represents a retention-product of the sebaceous glands.

The epithelia from which the contents of milia are produced at times tend to develop into other than horny formations. Thus, Foster, of Boston, describes a case in which the process of calcification had apparently been complete; Wagner observed colloid contents in certain opalescent lesions which appeared on the cheeks and temples of a woman. Virchow and Rindfleisch describe milia of the hair-sacs and similar lesions accompanied by cysts of the adjacent hair-follicles. In some cases the cause of milia is to be sought in obscure changes by which the epithelia of the follicle are primarily affected. Robinson believes that milia originate from miscarried embryonic epithelia from hair-follicles or from the mucous layer of the epidermis.

Diagnosis.—Milia might be mistaken for minute vesicles containing a milky fluid, but puncture of the lesion, with expulsion of its contents, at once discloses their character. Comedones with blackish external points, surrounded by the patulous orifice of the excretory duct and prolonged more deeply into the substance of the skin, could scarcely be confounded with milia.

The most minute of the lesions of xanthoma have a yellowish color, and cannot so readily be scraped away from the subjacent tissue as can milia.

Treatment.—Milia rarely require treatment, as they are usually relatively few in number, and produce neither subjective sensation nor deformity. If desired, they may be opened with a fine milium-needle and their contents turned out, or they may be scraped off with a curette. To insure their non-recurrence, the little sac left after the operation may be entered with a needle which has been dipped in a 50 per cent. solution of chromic acid. This operation may have to be repeated in the rare cases in which the lesions exhibit a tendency to recur.

The convenient method of removing these and many similar-sized lesions of the skin is by electrolysis. With from four to six cells in the circuit the negative pole is connected with a fine needle, which is introduced within and beneath the lesion, while the moistened sponge of the positive pole is in contact with the skin of the patient. This operation is bloodless and effectual, insignificant scars resulting.

Occasionally milia upon the scrotum give rise to sexual hypochondriasis which may demand attention; suggestive rather than active operative treatment is needed in these cases.

Prognosis.—The prognosis is always favorable.

Milium Congenitale (*en plaques*) has been described by Crocker,¹ Hans Hebra, Wilson, and Fox, as a congenital condition in which occurs a reddish-yellow patch (destitute of hair when existing on the scalp) with well-defined border and a granular surface, constituted of minute yellowish papules, with comedones at the periphery and elsewhere.

¹ Diseases of the Skin, 3d ed., p. 1131.

Hypertrophy of the Sebaceous Glands, characterized by actual multiplication of the glandular acini, is described by Crocker¹ as of occurrence on the forehead, nose, and other parts of the face of the aged, often accompanied by minute disks of a light-yellowish or dirty-yellowish shade, having a central punctum corresponding to the opening of the duct. In other cases discrete nodules occur. The author cited has noted their concurrence with jaundice and general xanthoma. In one case pinhead- to hemp-seed-sized, opaque and sometimes superficially vascularized papules with depressed centres formed; the smaller were semitranslucent; some contained a central plug that could not be expressed.

We have observed this condition in two middle-aged women in good health. The lesions in both instances were scattered singly or in groups of three or four over the face. Some of the lesions suggested strongly those of molluscum contagiosum. In some the disk was apparently made up of three or four pin-head-sized lobules coalescing about a depressed follicular opening which was not always centrally situated. We have seen the condition also preceding the development of superficial epithelioma, and also when existing on the face with development of similar lesions upon the backs of the hands distinctly epitheliomatous in type.

Pollitzer² reports a case of this type in which the lesions were arranged in a double row, about an inch and a half long, on the forehead above the left eyebrow. As the result of histological examination, Pollitzer reported the case as one of adenoma sebaceum, although clinically it did not correspond to the cases usually included under that title. On the other hand, Marrullo,³ Whitfield,⁴ and others find that the cases which clinically are known as adenoma sebaceum, show histologically an hypertrophy and not the structure of adenoma.

STEATOMA.

(Gr., *στέαρ*, fat.)

(WEN, ATHEROMA, PSEUDO-ATHEROMA, SEBACEOUS CYSTS, SEBACEOUS TUMOR. *Fr.*, STÉATOME, KYSTE SÉBACÉE; *Ger.*, BALGGE-SCHWULST, GRÜTZBEUTEL.)

Symptoms.—The history of the development and career of wens does not greatly differ from that of milia. Wens are usually of slow growth; unattended by subjective sensation; occur as single or multiple, elevated, occasionally flattened, fixed or movable tumors on the head, the trunk, or the genitals; and, being larger than milia, may attain the size of a hen's egg. Centrally or laterally placed is seen usually on the surface of each a patulous orifice closed with a black-

¹ *Ibid.*, p. 1131.

² *J. C. D.*, 1893, xi., p. 475 (with clinical and histological illustrations).

³ *Zeitschrift*, 1902, ix., p. 166 (with bibliography).

⁴ *B. J. D.*, 1902, xiv., p. 326.

ened horny plug suggesting a giant-comedo. They are situated beneath, within, or upon the skin; usually are unattached to the deeper contiguous tissues; and develop into irregularly globular, occasionally large button-shaped masses, covered by an integument usually unprovided with hairs. This envelope may be normal in hue, or unnaturally whitish from pressure; or, especially upon the bald scalp of certain fleshy men of middle years, reddened, shining, and greasy in appearance. Their semisolid cheesy and milky contents often emit a nauseous odor. At times the cysts are to be distinguished only by passing the fingers through the long hairs of the scalp beneath which they are hidden; at other times they are so conspicuous in consequence of physiological alopecia as to occasion considerable disfigurement. They vary greatly in consistence, but usually produce to the touch a certain feeling of elasticity, especially if the cyst be distended tensely. They may persist for years without producing inconvenience save that resulting from their bulk and the consequent disfigurement, but may be attacked by inflammation, resulting in suppuration and ulceration.

Cysts (*Sudoriparous Fat-cysts* [Dubreuilh]) of the steatoma type may be single or multiple and numerous. Maclaren¹ reports the case of a lad, nineteen years of age, having tumors of this sort over the entire body-surface; they resembled fibromata, but were found on examination to be sebaceous in character. Dubreuilh, Auché, and Chiari have reported similar cases in which pin-head- to pea-sized, firm, well-rounded lesions, subcutaneous in situation, but at times projected from the surface, had either the color of normal skin or were grayish-yellow in hue, occurring about the axillæ, the scalp, the extremities, or generally over the trunk. They contained a semifluid material, and were found to be thin-walled cysts with a tenuous envelope, epithelium-lined, derived originally from the coil-glands. We have had under observation a young woman the upper part of whose chest was covered thickly with pin-head-sized and somewhat larger retention-cysts covered with normal skin, the contents of which were wholly sebaceous.

Chalazion is a term descriptive of pin-head- to small-nut-sized tumors occurring in relation with the Meibomian follicles. They were thought once to be of sebaceous origin, but are now recognized as benignant new growths. A fungus supposed to be pathogenic has been recognized by Weyman.

Pathology.—Wens represent distention of the sebaceous glands by their contents, and response to the constant pressure in hypertrophy of the glandular envelope. Their contents, which are semisolid, curdy, cheesy, and granular, fluid and milky, or fluid and purulent, are the inspissated or chemically altered products of the gland-secretion, recognizable as such by the materials of which they are composed—masses of fat and débris of epithelia, with an occasional lanugo- or undeveloped hair.

¹ Brit. Med. Jour., October, 1886.

In some cases wens are more than mere retention-cysts, a benign new-growth of connective tissue forming the mass of the tumor. Calcareous and atheromatous changes in the contents of the cyst are common. Török, Chiari, and others claim that the majority of these growths are really dermoid cysts. Török¹ found a true papillary body in the walls of many of these cysts, and states, furthermore, that such cysts contained no fat. Ehrman and Fick² suggest that the pathogenesis may be explained by anomalies in the life-history of the cells of the sebaceous glands whereby they undergo horny rather than fatty metamorphosis, thus leading to retention and cyst-formation.

Diagnosis.—Steatomata are to be distinguished from true atheromata in that the latter exhibit no opening, never have odorous contents, always originate in the hypoderm, and frequently occur in portions of the skin other than the scalp. Steatomata are also to be distinguished from fatty tumors, which, however, are observed more commonly about the scapulæ, loins, buttocks, and extremities; while wens are very rarely found except about the scalp and neck; they lack also the peculiar "pillowy" feel of fatty tumors. Suppurating wens in the regions named may readily be mistaken for circumscribed abscesses if regard be not had for the history of the tumor usually long preceding. Syphilitic nodes and gummata of the same parts are usually both tender and painful; osteomata also are attached firmly.

Treatment.—The removal of a wen is accomplished by excision, after previous puncture of the sac and removal of its contents.

With antiseptic precautions ablation of these lesions from any part of the body may be regarded as unattended with great risk. Several fatal cases, however, are on record as the result of this operation, due not so much to the nature of the excised tumor as to its situation, surgical wounds of the scalp being particularly liable to erysipelatous and other complications. As the incision required for the removal of the wen necessarily must extend some distance on either side of the tumor, there results a linear scar, which on the bald scalp is often a very conspicuous relic of the lesion. In consequence of the possibility of danger many surgeons prefer destruction of a prominent section of the mass with acid or alkali, leaving the sac, after expulsion of its contents, to wither gradually, though it may then often be withdrawn with forceps.

Complete obliteration is sometimes effected by puncture, expression of the contents, and subsequent induction of artificial inflammation in the walls of the cyst by injection of tincture of iodine, pure sulphuric ether, or other irritating fluid, as in the operation for relief of hydrocele.

Prognosis.—The removal of the wall of the cyst is not followed by a return of the lesion. In debilitated and cachectic patients there may be spontaneous ulceration and sloughing, with or without sur-

¹ Monatshefte, 1891, xii., p. 437.

² Kompendium der Speziellen Histopathologie der Haut, Wien, 1906.

gical interference. Mr. Thomas Bryant¹ reports a carcinomatous tumor following the removal of a steatoma from the buttock of a woman sixty-three years of age.

Congenital Fibro-sebaceous Disease.—Crocker reports two instances occurring in infants who at birth exhibited signs of the disease, in which patches with an area of “several square inches” were visible on the face, the front of the neck, and in front of and above the ear. These patches were slightly raised, of a pale reddish-yellow color, finely granular over the surface, and consisted of closely aggregated, pale-yellowish, pin-point-sized papules, the patches being sharply defined with many comedones at the borders. These growths, on section, seemed to be due to a fibrous hypertrophy resulting in atrophy of the hair-follicles and coil-glands, and separation of the lobes of the sebaceous glands.

Sebaceous Cystic Disease is reported by Cook, Hutchinson, and others, in cases in which steatomata in typical situations resulted in

FIG. 184.



Multiple sebaceous cysts of the scrotum.

ulcerations of malignant type; in still other cases fungous tumors of considerable size formed, requiring surgical attention.

¹ B. M. J., 1884, i., p. 1044.

COMEDO.

(Lat., *comedo*, spendthrift.)(BLACK-HEAD. *Ger.*, MITESSER; *Fr.*, ACNÉ PONCTUÉE, ACNÉ COMÉDON.)

Symptoms.—Comedones are grayish, blackish, yellowish, or otherwise colored, dots or points, resembling grains of powder sprinkled over the surface of the skin, each point representing the external extremity of a plug of inspissated secretion lodged in the excretory duct of a sebaceous gland. Occasionally the comedones project to an appreciable distance above the general level of the integument, but often the extremity of each plug is slightly depressed below that level. There may be but two or three comedones upon the face, which is their commonest seat; or the nose, forehead, cheeks, and chin, the front and back of the neck, the concha of the ear, the back of the trunk, and the penis may be studded with them thickly. They may also be found upon the hairy scalp. The visible extremity of the comedo varies in size from that of a needle-point to that of a pinhead. Comedones are readily expressed from the follicles in which they are lodged, and when thus examined they are seen to be whitish moulds of inspissated sebum, one or two lines in length, the exposed extremity of each comedone having become discolored by diffused pigment deposited within. In consequence of this suggestive appearance of the lesion the disease has been called vulgarly "black-heads" and "skin-worms." The deformity produced in the face when these lesions exist there in large numbers is strikingly conspicuous, and it is for the relief of this appearance chiefly that the practitioner is consulted. The subjective symptoms awakened are of trifling moment. The disorder is essentially chronic in its course. Isolated comedones may be observed for years in one situation without apparent change or modification of any sort, and without producing the slightest local or constitutional derangement. Others appear, only to disappear under the influence of the usual hygienic regimen of the skin of the face. Others, again, serve to irritate the skin in which they are implanted, precisely as though they were foreign bodies; and the sebaceous glands and periglandular tissues, with and without the operation of such cause, exhibit grades of hyperæmia and inflammation, the lesions becoming those of acne. Comedones occur as the sole lesions of the skin, even to the extent of great multiplicity; more frequently they coexist with other diseases of the sebaceous glands, chiefly acne and oily seborrhœa.

Occasionally a so-called DOUBLE COMEDO is found. When expressed from the skin the plug of inspissated sebum is seen to have both extremities discolored. Grouped comedones, first described by Thin¹ are commonly found in symmetrical disposition on the

¹ Lancet, 1888, ii., p. 712.

cheeks, but may occur upon the back and chest, as reported by Little¹ and MacLeod.² They usually do not coexist with other lesions of acne vulgaris. Scar-comedones, single, double, and grouped, have been recognized in the form of atrophy of the follicular orifice (Lang, Selhorst, Thibierge). Large and numerous lesions of this type have been reported after kerion (Crocker), and variola (de Coquet).

Etiology.—Comedones may occur at any period of life, but, like seborrhœa, are most frequently observed at the puberal epoch in both sexes, when the pilo-sebaceous structures take on a greatly increased activity. They may occur in children, with a special tendency to grouping in places subjected to heat and moisture. Recently we have recognized them in typical development and considerable number on the face of a nursing infant. Crocker was first to notice the fact of their occurrence in young subjects. Much has been written with reference to neglect of the skin as a cause of comedo, the non-employment of soap in washing the face, and the influence of the trades, as in the case of those who work in metals, dust, and tar; but observation shows that these are rather exceptional causes. On the one hand, very obstinate and generalized lesions occur in the skin of intelligent young men and women of the upper social classes, who regularly wash their faces with toilet-soap, who are rarely exposed to dust, and whose habits and recreations are of the most healthful character. On the other hand, observing the grimy faces of coalheavers, machinists, masons, and ink-manufacturers, one is impressed with the rarity of the disease in such laborers. Other causes of the constipation of the gland are unquestionably effective in most cases. This disorder is somewhat more frequent in thick-skinned brunettes, or in men with a characteristic reddish-brown and greasy-looking complexion than in individuals having a fair and delicate skin.

In many patients there is unmistakable connection between this disorder and chlorosis, scrofulosis, dyspepsia, habitual constipation of the bowels, menstrual derangements, and cachexia. This connection is demonstrated by the remarkable improvement manifested in the untreated skin when restoration of the general health is assured.

The microbacillus of Unna and Sabouraud may be found, as a rule, in the comedo-plug, but whether the bacillus causes or follows the formation of the comedo is an unsettled question. (See chapter on Seborrhœa.) *Acarus folliculorum* (see paragraphs under this title) is also found in the comedo, but plays no part in the etiology of the disorder. The grouped comedones are believed to be due to some form of local infection the exact nature of which is not determined.

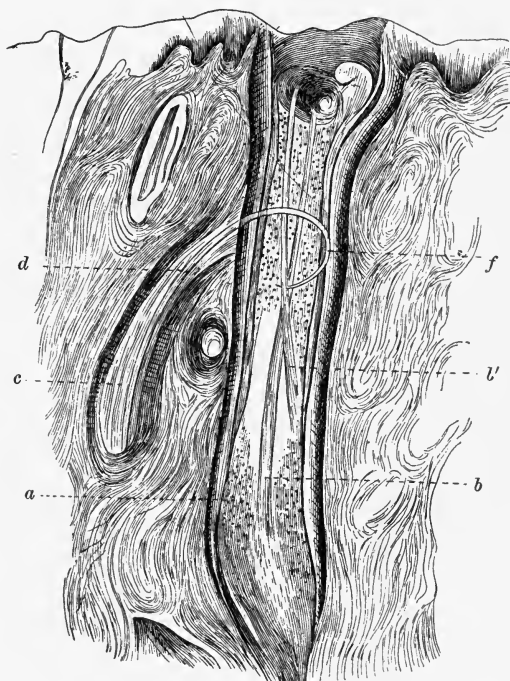
Pathology.—Comedo is a dense collection of concentrically arranged epithelial cells, in the centre of which are dried sebum, fragments of epithelia that have undergone partial fatty transformation, and minute lanugo hairs. It is located either in the excretory duct of

¹ B. J. D., 1903, xv., p. 253.

² B. J. D., 1903, xv., p. 453.

the sebaceous gland, or in the pouch-shaped canal common to the sebaceous gland and the hair-follicle. The first step in its formation is hyperkeratosis of the duct produced by some external irritation. In the regions in which comedones are found the sebaceous glands are

FIG. 185.



Section of a comedo: *a*, excretory duct of a sebaceous gland filled with a comedo; it contains also two small hairs with brush-like inferior extremities; into it opens a small hair-follicle (*c*); the contained hair (*d*), after touching the opposite wall of the duct, curves downward at *f*. (After KAPOSI.)

much larger than the hair-follicles to which they are attached. In consequence, as demonstrated by Biesiadecki, the hair-follicles often form obtuse or even right angles with the duct of the gland, causing the point of the hair to project against and irritate the wall of the duct. Unna, Sabouraud, and others believe the external irritation is furnished by a definite microorganism (see Seborrhœa), Sabouraud claiming that comedo is always preceded by oily seborrhœa. The blackness of the head of a comedo may be due in part to accumulation of dust or dirt, but is owing chiefly to a definite pigment which extends for some distance below the exterior face of the plug. This pigment is soluble in concentrated nitric or hydrochloric acid, and in hydrogen peroxide. The double comedo is believed to arise from the merging of two glands in close proximity by pressure atrophy of the tissues which normally separate them; thus one cavity with two ducts would be formed.

Diagnosis.—The recognition of the disorder is attended with no difficulty, patients themselves being usually sufficiently observant to identify the affection, though frequently misled as to the character of the “skin-worm.” It is, as might be expected, a frequent coincident of acne; its lesions, when commingled with those of the disease last named, being either in preponderance or so infrequent as scarcely to attract the attention of the patient. A condition somewhat resembling comedo may be produced upon the face when tar or ointments of mercury and sulphur are applied to it at the same time, the resulting black sulphuret appearing conspicuously at various points upon the skin, often at the orifices of the sebaceous glands.

Treatment.—The internal treatment of patients affected with comedo is that described in connection with the subject of Seborrhœa. Cod-liver oil, iron, the bitter tonics, and the medicaments indicated by any special condition of the patient’s health are not to be omitted. Open-air exercise, daily cool salt-and-water bathing, as in the management of seborrhœa, and the avoidance of all medicinal and dietary articles which might tend to aggravate the disorder, are also imperative. Many of these patients require at the outset alterative cathartics, among which may be named the pill of blue mass (taken for several consecutive evenings, and followed by the effervescing sodium phosphate in the morning), calomel, cascara sagrada, and castor-oil.

Even aggravated cases of comedo are completely relieved when untreated in the course of time. The relief, however, may require years for completion. The rarity of comedones in middle life and advanced years sufficiently attests this fact. Presumably this natural cure is due to the removal of irritation within the duct in consequence of a more vigorous growth of lanugo-hairs with the increment of age. Absence of comedones from the scalp, with a few marked exceptions, where the hair is vigorous, is certainly a significant fact.

Comedones are removed artificially with the aid of an extractor. The instrument formerly employed for this purpose was shaped like a watch-key, the cylinder having a smooth bore and bevelled extremity. This clumsy tool is far surpassed by the exceedingly convenient comedo-extractor designed by Unna and modified by Piffard. Each end has a convex, bowl-like surface, with apertures cut to gauge and the orifices slightly countersunk. This extractor, or “presser,” is productive of far less pain to the patient than other instruments, and can be wielded, on account of its long shank, with greater precision and ease by the physician. The surface to be operated upon is previously moistened by spraying it with a solution of formalin (0.5 per cent.), of thymol and glycerin, or of eucalyptol and glycerin. Often a sharp-edged or well-rounded needle, firmly held in a needle-holder, may advantageously be employed alternately with the extractor, in opening certain follicles or loosening the plug of others. Many patients affected with comedo are advantageously treated by the aid of the massering-ball, described in the chapter on the management

of Acne. All these instruments should be disinfected scrupulously before use. The danger of such manipulations should never be overlooked. There are many advantages in selecting the hour before sleep as the time for all vigorous topical applications to the face. Ointments then applied can be left in contact with the skin during the night and the patient be at liberty to resume his usual vocation in the daytime, his face being free from conspicuous evidences of local treatment.

Once the comedones are removed the skin should be sponged and bathed with hot water, then thoroughly dried, and anointed with an ointment which may be medicated to suit the indications of each case. Sulphur, as in many disorders of the sebaceous glands, enjoys here a high reputation. In the strength of 10 grains (0.66) to 1 drachm (4.) to the ounce (30.) of cold cream or vaselin, it may be applied as an ointment; or as a lotion, in combination with spirit of wine, glycerin, etc. A useful application is suggested by Piffard—equal parts of sublimed sulphur, alcohol, compound tincture of lavender, glycerin, and camphor-water.

Mercurials are also of some advantage locally, but should not be employed at the same time with preparations of sulphur. The use at night, especially in obstinate cases, of the white-precipitate ointment, or of one compounded of 2 grains (0.133) of the red oxide to the ounce (30.) of cold-cream salve, will often prove of benefit. In the case of coarser skins, corrosive sublimate, 1 to 2 grains (0.066–0.133) to the ounce (30.) of glycerin and rose-water, may be substituted for the red-oxide ointment.

When extraction of the plug is not attempted nor permitted, something may yet be done to remove the inspissated mass. Repeated sponging every third night with 1 ounce (30.) of green soap, digested in an equal quantity of cologne-water, will at first seem to render the comedo more conspicuous, but will slowly operate to dissolve the sebaceous secretion.

An ointment containing 4 parts of kaolin, 3 of glycerin, and 2 of acetic acid, with or without the addition of a small quantity of ethereal oil, may be applied at night for a few nights in succession, the eyes being carefully protected, when the black points of the lesions are removed, and the comedones are then readily extracted. Citric or dilute hydrochloric acid is employed with the same end in view. These topical remedies cannot be considered as efficient in every form of comedo.

Comedones of the penis need not be treated. This injunction is suggested by the occasional demand made upon the physician by the sexual hypochondriac, who regards these lesions with singular alarm.

Prognosis.—As the disease naturally tends to spontaneous though occasionally long-deferred resolution the prognosis is favorable. Treatment in most cases will accomplish much in hastening the disappearance of the comedones. The most obstinate forms are those in

which the face, the back of the ears, the inside of the auricle, the neck, and the shoulders are studded with relatively small indolent comedo-points, about which the circular lip of the duct rises in a whitish rim. Such cases, however, are nearly allied to the forms of acne described elsewhere. With exceeding rarity, the comedo is merely the introduction to a more serious local affection. In early life a single prominent lesion is formed, and though the plug be frequently removed and finally be no longer reproduced, the orifice of the duct remains patulous in middle life. Slowly thereafter its walls undergo a metamorphosis and a warty epithelioma may result.

ACNE.

(Gr., *ἀκμή*, a point.)

(ACNE VULGARIS, VARUS. *Fr.*, ACNÉ; *Ger.*, HAUTFINNE, AKNE.)

Acne is a chronic inflammatory disease of the sebaceous glands and periglandular tissues, exhibited chiefly over the face, neck, shoulders, and anterior and posterior surfaces of the upper thorax, in the form of an eruption of papules, pustules, and smaller and larger nodules, usually intermingled with comedones, and often associated with seborrhœa of the scalp. It rarely develops before the puberal epoch, and is unusual after the third decade of life.

Symptoms.—The disease is characterized in general by the occurrence of several and usually numerous, light-red, dull-crimson, or violaceous, pinhead- to small-nut-sized, ill-defined papules, pustules, nodules, tubercles, or non-projecting indurations of the skin, often commingled with the symptoms of comedo and seborrhœa sicca. The lesions are isolated or irregularly scattered over the surface, which, however thickly studded with them, never displays a grouping or definite arrangement of the elements of the eruption. Many of the lesions are both slightly painful and tender, though upon this point there is a wide range of difference in various individuals. As a rule pruritic sensations are absent. The inflammatory process, which manifestly involves the sebaceous glands and periglandular tissues, may result in suppuration of several adjacent follicles, as a consequence of which coalescence occurs and pea- to large-nut-sized cutaneous and subcutaneous abscesses may form. In many cases, however, the suppuration is limited to the area of the individual nodule. Every feature of the disease, from the smallest papule to the largest subcutaneous abscess, may be displayed at the same moment in an affected individual. Under circumstances of special aggravation the disease may occur in acute forms, but it is commonly chronic, the acute phases being usually accidents of the general process. When resolution occurs the points of location of former papules and nodules are frequently marked by reddish-brown pigment spots which gradually fade with time. In aggravated cases in which suppuration has been extensive small pitted scars are left after the disappearance of the disease.

The lesions of acne are found most commonly upon the face, but they are seen frequently upon the neck, the shoulders, the back, and front of the upper chest, the genitals, and the extremities, and occasionally on other parts of the body, the palms and soles being excepted. The disease is intermittent in severity, the patient being at times relatively free from symptoms and at others conspicuously disfigured. It is frequently associated with mild or severe alopecia furfuracea and seborrhœa capitis, the totality of symptoms depending upon similar causes in the susceptible subject.

In acne certain clinical forms are recognized; these are conveniently designated by various terms which refer chiefly to external features.

Acne Punctata.—In this variety the apex of the developing papule exhibits the characteristic blackish punctum of the comedo about which the papule is forming.

Acne Papulosa.—In acne papulosa the lesions are of papular type, ranging in size from that of a millet-seed to that of a coffee-bean, whitish or reddish in color, and varying in the amount of induration at the base. They are often commingled with pustules, papulo-pustules, and comedones. At the apex of each papule may frequently be distinguished the blackish point characteristic of acne punctata; or a minute, greasy, yellowish-white spot, which represents the non-pigmented extremity of an inspissated sebaceous plug.

Acute Indurata.—This type of the disease takes its name from the dominant clinical feature and is characterized by the preponderance of deeply seated firmly indurated lesions. These have their beginning in the lower portion of the corium and in the subcutaneous tissue, develop toward the surface, and eventually appear as conical or rounded projections, of variable size and elevation above the normal skin. Their color ranges from a light red in the smaller to a dark red or violaceous hue in the larger lesions. In severe cases tenderness and pain are marked, and the presence of the livid swellings scattered over the face produces considerable deformity of feature. In the larger nodules suppuration occurs, manifested by fluctuation over the central portion, the base remaining indurated. Owing to the thickness of the roof wall the pus is seldom spontaneously evacuated. During resolution which occurs by slow absorption a collarette of scales is usually present about the lesion.

Acne Pustulosa.—This is the most frequently observed of the expressions of the disease. The lesions are apt to be commingled with papules, comedones, and intermediate phases between the functional and inflammatory disorders of the glands. The pustules almost invariably originate in previously formed papules and may be large or be small, containing merely a droplet of pure pus, or, when a true furunculosis ensues, a teaspoonful or more of pus may be mingled with blood and serum. This accumulation may be evacuated surgically or accidentally, or be absorbed, or may remain for a long period of time in a species of cyst, whence it can finally be

expressed. In aggravated cases two or more of these pustulo-furuncular dépôts may coalesce, forming nut-sized abscesses, or, not rarely, may become united by fistulous tracts, through which there is free communication of the fluid contents of two or more chambers.

Acne Vulgaris is a term applied to the composite eruption which is common to the majority of clinical cases. Here the various lesions described above (papules, pustules, comedones, etc.) are associated, usually on the face and over the shoulders, each in several degrees of development, often in conjunction with the scars left by a prior eruption. *Acne Disseminata* is another name given by some authors to this common composite type of the disease.

Acne Artificialis.—Various substances, either applied topically to the skin or ingested, are capable of producing acneiform lesions. Among them may be named tar, which may prove an irritant whether

FIG. 186.



Copyright 1900 by G. H. Fox.

Acne vulgaris. (From G. H. Fox's Atlas of Skin Diseases.)

employed externally or internally, and, far more frequently, the salts of iodine and bromine after ingestion. Tar-acne occurs both among workers in tar and in those subjected to the action of this substance for the relief of other cutaneous disease. Pinhead- to pea-sized,

reddish-brown papules then form, at the apex of each of which is perceptible a minute blackish punctum, produced by the lodgment of a particle of the medicament in the orifice of a sebaceous follicle. Pustular and furuncular lesions are, however, also produced, such as occur in bromic and iodic acne. In the latter disease the presence of the drug has been demonstrated in the contents of the pustular lesions. Chrysarobin and a number of other medicinal substances are capable of exerting a like effect.

Acne Atrophica and **Acne Hypertrophica** are terms employed to designate merely the lesion-relics of the disease. In acne atrophica there

FIG. 187.



Scars following acne vulgaris (untreated).

is complete atrophy of the gland-tissue, indicated by a minute sunken pit in the site of the former orifice. In acne hypertrophica there are, in consequence of the periglandular exudation, a thickening of the tissues about the acini, and a projection from the surface in the form of persistent pea-sized, and indurated masses.

Acne Cachecticum or **Scrofulosorum** includes the symptoms encountered in the subjects of struma, scorbutus, marasmus, chloro-

anæmia, and tuberculosis. The lesions are developed more often on the trunk and the extremities than over the face, and are indolent, papulo-pustules, pinhead- to bean-sized, remarkable for their livid, purplish, lurid-red, or violaceous tint. The lesions rarely are indurated; more often they are softish, pus- and blood-containing nodules, sluggish of career, leaving minute cicatrices. Their features are due to the general cachectic condition of the subjects in whom they occur. Colcott Fox describes *acne scrofulosorum* as it occurs in infants.¹

Keloid-acne (see *Dermatitis Papillaris Capillitii*) is a name which has been given to an inflammatory folliculitis and perifolliculitis, leaving deep hypertrophic scars, usually in the thick epidermis over the neck and the back of the trunk, though seen also upon the scalp and face. Wisps of thick, distorted, and evidently altered hairs project here and there from the affected surface. Reddish, and even vascularized nodes, tubercles, and bridges occur at intervals, interspersed with occasional acne-pustules and deep-seated, broad, even gigantic comedones. Sclerotic tissue, in brief, forms about the site of the acne-process quite like cicatricial keloid of the trunk and other situations.

Acne Keratosa is the *Acné cornée* of French authors. In this affection cornified masses of sebum distend and project from the orifices of the sebaceous glands, particularly over the neck, but also over the face, the trunk, the elbows, the knees, and other portions of the body. There is some doubt whether this disease should be classed with ichthyosis, which it unquestionably resembles, or with keratosis pilaris. By some French authors the condition is considered an early stage of keratosis (psorospermosis) follicularis.

Under this title Crocker² reports four cases in women in whom there appeared on the face, chiefly about the angles of the mouth, firm, painful, inflammatory papules, succeeded by pustules and crusts. From the centre of these lesions could be expressed short, soft or horny plugs which were formed evidently in the sebaceous glands or hair-follicles. On removing the plug the lesions healed slowly, in many instances leaving a scar. The disease was persistent, lasting in one case for forty years.

Acne Urticata is described by Kaposi, Touton, Löwenbach,³ and others, as occurring on the scalp, face, and other portions of the body. The primary lesion, which is preceded by itching and burning, is a small wheal which enlarges to the size of from 6 to 12 mm. the centre then becomes paler and depressed and shows a vesicle which dries into a crust. The crust falls, leaving a small scar which in time becomes depressed and shining white. The full development of a wheal requires from four to six days. The later stages of the process suggest acne necrotica both clinically and histologically.

Etiology.—Acne is probably the cutaneous disease of most com-

¹ B. J. D., 1895, vii., p. 341.

² B. J. D., 1899, xi., p. 1.

³ Archiv., 1899, xlix., p. 29.

PLATE LIII



Acne-keloid of the Back.

mon occurrence not excepting eczema. Its causes are numerous and in many cases obscure. They are both systemic and local, for even the most ardent advocates of the parasitic origin of the disease must admit that predisposition, based on constitutional conditions, is an important factor. The disease occurs usually in the second, and in most instances disappears during the third decade of life, although it occasionally persists or even begins later. Among the predisposing causes the changes incident to the age of puberty in both sexes are important. The great physiological activity manifest in the hair-follicles and sebaceous glands at this period of life is easily perverted to the pathologic by such frequently operative factors among young people as illness, malnutrition, overwork, or improper conditions of life.

The disease very often is related to disturbances of the gastrointestinal tract¹ especially constipation, hepatic torpor, and fermentative dyspepsia. The eating of indigestible food, overindulgence in alcohol, coffee, or tobacco, as well as overeating, frequently cause an outbreak of lesions in the predisposed individual. In the matter of diet individual peculiarities are evident; articles of food which are perfectly well borne by one may provoke an attack of acne in another. Certain drugs, more commonly the bromides and iodides, aggravate an existing acne. In women the disorder is frequently worse just before or during the menstrual period. At times reflex nervous influences seem to stand in causal relation to the disease. It must be said, however, that in many individuals suffering from acne no defect in the general health can be discovered.

In some cases the disorder is limited for long periods of time to a few follicles or to a small area, and is undoubtedly local in origin. Among the local conditions favoring the development of acne may be mentioned; oiliness of the skin due to hyperactivity of the sebaceous glands; mechanical plugging of the sebaceous follicles, as with dust and dirt; failure to remove with soap and water accumulations at the mouths of the follicles; irritation of the follicles by too frequent use of strong soaps or by the application of cosmetics; contact with dyed veils; and frequent fingering of the face which tends to disseminate over its surface pus-cocci and other microorganisms which are undoubtedly active factors in some, if not all, stages and varieties of the disease. Unna and Sabouraud believe the organisms they find in seborrhœa are the active agents in the production of acne, with or without the addition of pus-cocci (see Seborrhœa and Dermatitis Seborrhœica). Gilchrist² finds in acne-lesions bacilli similar to Sabouraud's micro-bacillus. From firm papules, in which clinical evidence of supuration had not yet appeared, he obtained in a large percentage of cases pure cultures of the bacillus, which he terms *Bacillus acnes*. He succeeded in cultivating this organism and show-

¹ Cf. Kapp, *Therapeut. Monats.*, 1907, March.

² *Trans. Amer. Derm. Assoc.*, 1902, p. 105; and *J. C. D.*, 1903, xxi., p. 107 (with review of work done in this field by other observers).

ing it to be pathogenic for mice and guinea-pigs. The sera of patients affected with acne causes a clumping of the bacilli, from which fact he infers that "a specific toxic body derived from the presence of the bacilli in the tissues is absorbed in the blood, resulting in the production of the specific agglutinin." He suggests that the systemic condition found in many cases of acne, instead of having an etiological significance, may be the result of absorption of the toxins of bacilli acnes. Söllner,¹ after an extensive investigation of the bacteriology of acne concludes that while many microorganisms are found in the lesions of the disease their etiologic relationship has not as yet been determined.

Pathology.—The earliest stage of the acne-papule is that described under comedo. Hyperplasia of the horny layer at the follicle-neck may continue without decided inflammatory changes and produce small, firm, normal-colored papules of the comedo type; or complete occlusion of the duct of the gland may result in a simple retention-cyst. As a rule, however, the retained sebaceous secretion acts as a medium in which pus-organisms rapidly develop, producing an inflammation which may be limited to the common excretory duct and the sebaceous gland, but which involves usually the hair-follicles and the tissues surrounding these structures. The pathological changes depend upon the extent and intensity of the process. All grades of severity are found between the superficial abscesses limited to the duct of the follicle, which disappear without leaving scars, to those instances where several glands and the intervening structures are involved in the formation of deep abscesses, which cause destruction of connective tissue and leave large disfiguring scars. In many of the nodules the inflammation is subacute in type, persistent, and accompanied by infiltration of plasma-, mast-, and connective-tissue-cells, resulting in true connective-tissue proliferation and the consequent formation of indurated scars. The relation of microorganisms to the disease has been referred to above.

Diagnosis.—The typical facies of acne vulgaris is readily recognized by the characteristic features already described. The reddish papules, pustules, comedones, and "lumps" in the skin of the face of a young subject; the evident involvement of the sebaceous glands; the history of a chronic affection destitute of itching and, though possibly picked, quite unscratched; the occasional blood-crusts where lesions have been squeezed or incised, are all significant facts. The pustular syphilide of the face is not only to be differentiated by its share in the history of an infectious disease, but also by the occurrence of characteristic crusts, its selection by preference of the regions about the nose and mouth, its evolution in groups, and its sequels in the form of superficial or deep ulcerations. Nevertheless, simple acne is common in syphilitic subjects. Potassium iodide is so frequently administered for the relief of syphilis, and in so large a majority of cases induces its artificial acne, that the latter eruption often

¹ Münch. med. Wochenschr., 1904, No. 38.

precedes the evolution of the macular syphilide, and also with frequency masks the latter by a commingling of lesions. Simple acne is common also among those who are veterans of syphilis. Acne certainly at times resembles variola, and cases of the former have been mistaken for the latter. In most instances the absence of fever and a brief delay will end any doubt.

Treatment.¹—Acne is an entirely remediable disease in every case properly managed. Scars of ancient ravages of the affection are, it is true, indelible, but even these are smoothed down in the progress of time so that they become yearly less conspicuous and disfiguring. In all instances, whether the case is mild or severe the physician who takes charge should explain to the patient that the disease *per se* tends to produce scarring, and that the best preventative of unsightly cosmetic results is intelligent treatment.

The general treatment of acne requires a careful and exhaustive study of the special requirements of each individual case. A thorough investigation of the habits of living—food, diet, bathing, occupation—and bodily functions, according to the methods described in the chapter devoted to General Diagnosis, is essential at the outset.

An important consideration, in undertaking the treatment of a patient affected with acne, relates to any local or internal medication previously employed. A large proportion of all patients first claim the attention of the physician after ingesting drugs or making topical applications which have decidedly aggravated the original trouble. With or without the advice of others, such patients have often been engaged for months in swallowing various nostrums calculated to "drive out" disease, many of them containing potassium iodide; or for the relief of headache have resorted freely to the use of proprietary preparations charged with acetanilid or potassium bromide; or have rubbed over the skin some patent salve containing tar. In every such instance treatment should be directed toward the relief of the artificial acne, after which the real condition of affairs can be recognized more clearly. The patient should be told to discontinue his or her former practice, to bathe the affected part with hot water at night, and after the surface is dried to apply any bland unguent. By these simple measures alone many cases of acne can be improved greatly, and some be relieved completely.

The question of diet is of the highest moment. The kind and quantity should be suited to the occupation of the individual, as for the school-boy and the school-girl, or the adolescent employed in factory or on the farm or in domestic labor. All over-fed subjects of acne are benefited in a high degree by reducing the quantity of food ingested especially in the items of meats and sweetstuffs. A milk-diet, or one composed largely of fresh fish, fruits, and the lighter vegetables, will usually brighten up the most obstinate case. Confectionery, highly spiced food, pastry, hot bread and cakes, sugars,

¹For a discussion on the treatment of acne before the American Dermatological Association, see Trans., 1902, p. 119; and J. C. D., 1903, xxi, p. 136.

and fried articles are all excluded with great advantage. Alcohol is generally to be prohibited; and it is idle to treat a severe case of acne in a young male subject who cannot for the time abandon the use of tobacco in every form.

Since dyspepsia and constipation are frequently causal factors in the disease, it is necessary to correct these disorders when present. A blue mass pill or calomel on several consecutive nights followed by a saline laxative in the morning is usually indicated at the outset of treatment. The cascara compounds are especially valuable when it is necessary to continue the use of a laxative for more than a few days. Some modification of Startin's acid mixture, such as the following, will be found suitable for other cases:

R	Magnes. sulphat.,	5ij;	60	
	Acid. sulphur. dil.,	f5ij;	8	
	Sodii chlorid.,	5j;	4	
	Ferri sulph.,	gr. v;		33
	Cardamom. tinct. co.,	f5j;	4	
	Aq. dest.,	ad f3viiij;	ad 240	M.
M.	et filtra.			

Sig. A tablespoonful in a tumblerful of water before breakfast.

Other cathartics, saline and alterative, will often prove serviceable. The mineral waters, Hathorn, Carlsbad, Hunyadi János, Racoczy, or Kissingen, a tumblerful before breakfast, are exceedingly valuable in cases of habitual hepatic and intestinal torpor. When there is an acid form of dyspepsia the rhubarb and soda mixture, or milk of magnesia in dessertspoonful (8.) doses, will be serviceable. Mercurous iodide in small doses, true sodium salicylate, and the dilute nitro-hydrochloric acid are often of value in aiding elimination. Some cases improve rapidly on taking each night enough castor-oil to cause a daily free evacuation of the bowels. Salol and other intestinal antiseptics are sometimes effective.

In those cases of acne in which inactivity of the large intestine is a factor, thorough irrigation of the bowel, together with daily exercises which will strengthen the abdominal muscles and stimulate peristalsis, are often followed by complete recovery. For these patients abdominal massage is of great value. Large quantities of pure water drunk between meals aid greatly in the matter of elimination. Iced drinks should be avoided. As a rule, it is advisable to take but little liquid with food; the unwholesome habit of rapidly bolting a meal without proper mastication is thus largely overcome. In many instances, however, a cup of warm, but not strong, tea, cocoa, or coffee at the close of the meal is helpful to digestion. Where gastric motor and secretory insufficiency is present pepsin, nux vomica, and dilute hydrochloric acid are valuable remedies. Pancreatin and diastase may be used if intestinal indigestion exists.

Daily exercise in the open air is necessary to stimulate sluggish glandular systems into proper functional activity. Such exercise to be of value should be carefully adjusted, both in kind and in amount, to the needs of the individual.

A most important part of the treatment in every case is without question the daily bathing of the entire surface of the body (with exception of the face, which requires special attention as elsewhere shown; and excluding the menstrual period in women) with water as cool as can be tolerated, followed by rapid sponging, and by brisk friction with coarse towels or with a flesh-brush until the skin is glowing. Common salt may be added to this bath in the strength of $\frac{1}{4}$ pound of salt to each gallon of water, unless contraindicated by irritability of the general body surface. The results of this treatment are excellent in the majority of cases, especially in those in which the patient has been accustomed to the hot or Turkish bath, which may aggravate affections of this class.

In nervous and overworked patients sufficient sleep at regular hours should be secured, and when possible short periods of rest during the day should be obtained. In some of these cases the indigestion and consequently the acne can be made to disappear with no other treatment than ten minutes of complete physical and mental relaxation before meals, and half an hour of comparative inactivity after eating. In a growing boy or girl relief of acne often can be best accomplished by shortening the school-hours, and by carefully selecting studies and occupation adapted to the physical and intellectual development of the individual.

The sexual life of both the married and the unmarried should be regulated according to the laws of hygiene. Pelvic disease, when this complication exists, should receive proper treatment; especially, in these cases, should attention be paid to the general health, as patients of this class are often chlorotic young women leading sedentary lives, or overworked at the school-desk, the sewing-machine, or the shop-counter.

Internal medication for the relief of the disorder should be determined largely by the general condition of the patient. Remedies to combat abnormal gastro-intestinal conditions have been mentioned. Cod-liver oil, iron, strychnine, phosphorus, the mineral acids, and the bitters are needed in chlorosis and cachexia. Calcium sulphide, long highly esteemed in the management of acne, is now discarded. Arsenic, however, is a valuable drug in many cases. The internal employment of ergot in full doses for the relief of acne has occasionally been followed by excellent results. Glycerin in teaspoonful to tablespoonful doses three times daily has been recommended. Ichthyol is used empirically with success.

In all cases, whether previously treated or not, which have been purged of suspicion of an artificial element, the local treatment is of prime importance, and in the perfection with which its details are observed lies the key to success. It is not the selection of one of the several remedies of the many advocated for the relief of the disease, nor yet the successive substitution of one for another to meet any transitory indication in each case, that conduces to the happiest result; but it is rather the use of a single method of recognized value,

and its skilful adaptation to the changing conditions of the disease.

For many cases of acne the most rapidly effective local treatment is found in the skilful use of the *x*-rays. Under their influence pus-formation ceases, and the lesions gradually disappear. Prolonged or energetic treatment should not be employed in any case owing to possible future atrophy of the skin. It is not necessary to produce visible evidence of dermatitis to get good results. The method should always be employed in moderation both as to the quantity of *x*-rays at each sitting and number of sittings during a given period. As a rule the method should be reserved for those cases resistant to other forms of treatment. In a large number of selected cases we have found it superior to other methods of local treatment. Many other observers, among them Pusey¹ and Campbell,² report equally favorable results from the *x*-rays. Good results are obtained by repeating the exposures twice weekly for three or four weeks using a tube of medium quality placed about eight inches from the surface exposed and excited by a mild current. The duration of each séance is limited to three, four, or five minutes. Recurrences happen less often after radiotherapy and are usually of moderate intensity.

It is always necessary in the local treatment of acne to evacuate the contents of pustules, to express from the summits of papules (where are the orifices of sebaceous ducts) all densely inspissated plugs of sebum, and to remove any comedones present with the aid of the comedo-extractor. In many cases this operative treatment, especially the removal of comedones, is easier and more satisfactory after several days of the hot bathing and ointment-applications recommended in the following paragraphs. For the purpose of opening the superficial and smaller purulent collections an ordinary cambric needle of good size is decidedly preferable to a knife, and for the larger and deeper furuncular lesions a bistoury with a delicate and very narrow blade should be used. A slight degree of skill will here repay the operator. By counter-depression with the fingers the whitish-yellow or blackish orifice of the duct may be detected, and at this point the needle or the bistoury should be thrust sufficiently deep to insure removal of pent-up pathological contents. Should blood flow in droplets from any of these slight wounds, it is rather to be encouraged than repressed, as relieving the hyperæmia and engorgement of the small periglandular phlegmon. In one or several sittings all lesions requiring such interference should carefully be attacked, and immediately after each operation, preferably while pus and blood still are oozing, the part is to be bathed for several minutes with water as hot as can be borne with comfort. For many reasons the hour before retiring is preferable, though not always practicable, in treating such cases, as then a soothing application can be made which may remain until the following morning. One or several of

¹ Pusey and Caldwell, *Röntgen Rays in Therapeutics and Diagnosis*, Philadelphia, 1903.

² *J. A. M. A.*, 1902, xxxix., p. 313.

these operations will do much to relieve the skin of its engorgement and retained inflammatory products.

One of the most valuable methods of local treatment consists in first stimulating the sluggish skin marked with the lesions of acne until a slight dermatitis is produced, after which soothing applications are made until the reaction has subsided. By thus alternately stimulating and soothing the diseased portion of the skin distinct improvement usually results in a relatively short time to the satisfaction of the patient. The treatment in detail as applied to the face would be as follows:

The patient is seated before a basin of water, which is as hot as can be tolerated with comfort, and, with a pad of white flannel or a sponge of absorbent cotton or gauze, the face is bathed until the skin is thoroughly moistened and softened by the heated water and steam. From ten minutes to half an hour may well be employed in this way. While the face is still wet all pustules which have formed are emptied in the manner described above and a sufficient quantity of tincture of green soap (*linimentum saponis mollis*, U. S. P. VIII) is poured over the flannel or the sponge, with which the face is then thoroughly scrubbed. Finally, the skin-surface is cleansed with a surplus of the water, is carefully dried, and is anointed with a sulphur ointment, of a strength of 5 grains (.33) to 1 drachm (4.) to the ounce (30.) of cold cream salve and vaseline. In the morning the face is to be washed with hot water followed by cold.

Some range may be observed in the employment of the two substances named. Thus, the tincture may be diluted with cologne- or rose-water, one-half or more; or the soaps employed, in less imperative cases, may be the best toilet-soap, Sarg's glycerin, or sulphur soap. The ointment, too, may be compounded by adding with the sulphur, half of the same quantity of resorcin to the ounce (30.) of base.

This operation of steaming, soaping, and anointing is to be continued, according to the severity of the case and the tolerance of the patient, nightly, or on alternate nights, until the face presents a distinctly inflammatory reaction. After from two to ten days of this vigorous treatment the skin usually becomes reddened, slightly tumid, and often moderately furfuraceous. To the patient it feels tense, slightly painful, and as if made of leather. When this condition of artificial dermatitis appears the use of hot water, soap, and ointment should be discontinued, and for a few days some of the sedative lotions and ointments recommended for the treatment of acute eczema should be employed; for this purpose the zinc oxide and liquor calcis lotion is especially well suited. When the artificial dermatitis has subsided the stimulating shampoo and ointment may be resumed, and the entire process be repeated. Gradually as the lesions disappear the vigor of the treatment should be relaxed; first the soap, then the hot ablutions should be withdrawn, and finally a less stimulating application should be substituted for the sulphur pomade.

In those cases where it is desired to produce stimulation and ex-

foliation quickly the paste recommended by Lassar is useful—that is, 1 part of beta-naphтол, $2\frac{1}{2}$ parts each of vaselin and *sapo viridis*, and 5 parts of precipitated sulphur—spread over the skin for from fifteen to twenty minutes, and then wiped off, when the surface is dusted with a simple powder. Soothing applications may be used with advantage before a second application. Lotions of mercuric chloride are of value where antiseptic and keratolytic effects are desired.

Sulphur is rightfully accorded the first place among the remedies for the local treatment of disorders of the sebaceous glands, and aside from the ointment above mentioned is a constituent of many preparations of real worth in the management of acne. One of the best is Vleminckx's solution (see page 107), of which from 5 to 50 drops in a tablespoonful of hot water may simply be mopped on the face and allowed to remain over night, or may be applied with gentle friction and massage.

The following lotion is of service in resolving cases:

Rx	Sulphuris loti,	3iij;	12	
	Sodæ biborat.,	3ij;	8	
	Glycerin.,	f5vj;	24	
	Aq. dest.,	ad f3vi;	ad 180	M.
Sig. Shake well and apply freely, leaving a thin film of powder over face.				

Duhring recommends the following:

Rx	Sulphur. præcip.,	5ij;	8	
	Glycerin.,	f3ij;	8	
	Alcoholis,	f3j;	30	
	Liq. calcis,	f3i;	30	
	Aq. ros.,	f3ij;	60	M.
Sig. Shake the vial before using.				

This mixture made up without the liquor calcis has also proven efficacious.

Resorcin, next to sulphur, is probably the most valuable remedy in acne as in other sebaceous gland disorders. It may be used in the above formulæ in place of sulphur, or combined with it in strength varying from 2 to 10 per cent. Ichthyol and thiol are similar in their action to sulphur, and sometimes succeed when the latter fails. They may be used in ointments, in lotions, or combined with glycerin. The discoloration produced is easily removed, as both substances are soluble in water.

Ammoniated mercury, 2 to 15 per cent., in lanolin or other simple ointment is an effective remedy. Mercuric chloride is very generally employed in the strength of from $\frac{1}{8}$ to $\frac{1}{2}$ grain (0.008–0.033) to the ounce (30.) of emulsion of bitter almonds as a lotion; and the protoiodide and biniodide of the metal are similarly applied in lotions and unguents, in the strength of from 5 to 10 grains (0.33–0.66) to the ounce (30.). One should be careful not to make use of mercurials at the same time with a compound of sulphur, lest a chemical

combination occur by reason of which mercurous sulphide (æthiops mineral) be precipitated upon the skin and produce the appearance of comedo.

Van Harlingen employs with success in acne 1 drachm each (4.) of sulphureted potassa and zinc sulphate to 4 ounces (120.) of rose-water. Fox applies $\frac{1}{2}$ drachm (2.) of chrysarobin to the ounce (30.) of collodion. Taylor advises from 5 to 25 grains (0.33–1.66) of zinc iodide to the ounce (30.) of vaselin.

For mild cases an excellent lotion is obtained by adding 2 drachms each (8.) of simple tincture of benzoin and glycerin to 4 ounces (120.) of distilled water, to which, where a more stimulating effect is desired, 1 ounce (30.) of cologne-water or of alcohol may be added, or 1 scruple (1.33) of sulphuretted potassa.

For chronic and indolent cases a modification of the local treatment of acne may be employed by the aid of an instrument called the "massering-ball." This instrument consists of a stout, short handle of hard rubber, connected by means of a slender steel neck with a ball set in a steel socket, the small sphere rotating within the cup of the socket, as in an ordinary ball-and-socket joint. The free play of the ball is aided by its bearing upon a smaller ball set in the neck of the cup attached to the handle, which is fixed upon the socket at an angle sufficiently convenient for the operator, whose eye can thus better follow the play of the ball. The ball is constructed of hard rubber, and the area of its impact upon the skin at any moment is about that of the human thumb of average size similarly placed. When actually in use the ball travels with ease as well along the angles of the nares with the cheeks, the bridge and root of the nose, and the regions below the symphysis menti, as over the brow, the temples, the chin, and the cheeks. When necessary to cleanse the instrument the ball is detached by unscrewing; but the entire instrument may be boiled without impairment of its usefulness.

When ready for treatment the skin is first operated upon with aseptic needle and comedo-extractor until all pustules and subepidermic foci are emptied and conspicuous comedones are removed. After this the surface is cleansed with a weak bichloride lotion or with alcohol. The massering-ball is then rotated freely over the surface, and deep pressure is made upon the affected region, with the result of bringing into view groups of previously inconspicuous comedones, which are in turn removed by the extractor or "presser." Lastly massage of the surface is practised with the ball by the aid of a salicylated cocoanut-oil or by one of the sulphur unguents.

In the milder forms of acne, and especially where the disease involves the trunk, precipitated sulphur alone, or better, in combination with other powders in varying proportions, is of great service when dusted on the affected parts daily. The diluent may include one or more of the following: starch, rice flour, zinc oxide, zinc stearate, and talc.

Treatment by the opsonic method (see General Therapeutics) has

been tried in acne by a number of observers.¹ While it is perhaps too soon to pass final judgment the early promises of value in this form of treatment have not been realized. Recurrences are common, and the amount of time and extent of laboratory equipment required for the proper application of the most efficient technique are seldom at the command of the practitioner.

In the severe forms of acne indurata and acne pustulosa treatment by the Bier's hyperæmic method may be found useful. Cupping glasses suited to the lesions may be applied, or the neck band may be worn, as described in the chapter on General Therapeutics.

Prognosis.—The majority of patients, even when untreated, eventually recover. This natural involution of the disease is commonly attained as the body arrives at the maturity of its development. Appropriate treatment has, however, a satisfactory influence in hastening the recovery of practically all patients; it also lessens the degree of subsequent scarring. A certain amount of cicatrix formation must be looked for in severe cases; occasionally keloid occurs as an unpleasant sequel to the disease. Exceedingly rebellious and even grave cases occur in the cachectic, those long and improperly treated, and those who from necessity are continuously exposed to influences unfavorable to the involution of the disorder, such as the subjects of epilepsy habitually ingesting potassium bromide, and the victims of syphilis requiring persistent use of the salts of iodine.

ACNE ROSACEA.

(ROSACEA, GUTTA ROSEA, TELANGIECTASIS FACIEI, NÆVUS ARANEUS, "BRANDY-NOSE," COPPER-NOSE. *Fr.*, ACNÉ ROSÉE, COUPEROSE; *Ger.*, KUPFERROSE, KUPFERFINNE.)

Acne rosacea is a chronic disease of the skin of the face, often developed from or associated with the lesions of acne vulgaris, and is characterized by hyperæmic areas, or patches of dull-red erythema, telangiectases, inflammatory papules, or growths which may attain the size of a hen's egg.

Symptoms.—Acne rosacea is displayed most often upon the nose, cheeks, and chin, but may occur on any parts of the face, and rarely on the lateral regions of the neck. It is seen usually in middle life, and occurs rarely before the twenty-fifth year. In a first stage there is a more or less diffuse pinkish or dusky, but transitory redness, involving the extremity of the nose and its contiguous parts, which coloration may extend from this region in a somewhat symmetrical figure over the brow, cheeks, and chin. The redness may be spread uniformly over the regions involved, or displayed in irregular, ill-defined blotches which vary greatly in size and shape. The spots may be roundish, radiating, stellate, linear, tortuous, or of fantastic outline.

¹ See Pernet and Bunch, B. J. D., 1906, xviii., p. 427, and Wright, Brit. Med. Jour., 1904, May 7.

The colors vary from a delicate rosy-pink to a deep-purplish crimson. Minute capillaries often ramify over the erythematous surface. The effect is a marked unsightliness, for which chiefly, or only, the advice of the physician is sought, as the affected parts give rise to few or no subjective sensations. Under pressure with the diascopé the color disappears; the surface seems cool rather than hot; and the sebaceous glands are seen to be affected, as there is usually present either a seborrhœa oleosa or an accumulation of yellowish-white, moderately inspissated sebum in the patulous orifices of the gland-ducts.

The disorder varies greatly with the general condition of the patient. At times it may scarcely be perceptible; again, after the stimulation produced by ingested food or by alcohol, after mental excitement, a paroxysm of coughing or laughing, or exposure to external irritation the lesions may be conspicuously deforming. This condition may endure for months or for years and then disappear, or may be succeeded by a second stage of the malady.

In a second stage the redness becomes permanent, though subject to frequent variations in intensity, capillaries dilate passively and appear as conspicuous, tortuous, straight, or anastomosing lines of reddish color about the nose, cheeks, chin, or forehead. Firm, purplish-red, painless, pinhead- to pea-sized nodules or papules, at times pustules, often rise from the erythematous surface, and they either display minute superficial and tortuous blood-vessels in the integument with which they are covered, or they project from a base about which such a telangiectasis has very irregularly been developed. The lesions are apt to be intermingled with those of seborrhœa oleosa, comedo, or with acne vulgaris. When fully developed, this stage of the disease, though generally not productive of marked subjective sensation, produces an exceedingly conspicuous deformity.

In the third stage (which is the most pronounced of the three) roundish, sessile or pedunculated, lobulated or pendulous, firm, elastic, pinkish-red, bluish, livid, or violaceous vegetations, traversed by a finer or larger network of blood-vessels, slowly develop about the affected part of the face, chiefly the nose. These vegetations may be single or multiple, and in the latter case may be isolated or so closely united as to be scarcely distinguishable from one another. The acneiform lesions seen in the second grade of the disease may here also be apparent. The nose is often cold to the touch when bright red in hue, and it may be oily or greasy in appearance in consequence of a seborrhœa oleosa of the part. The so-called "brandy-drinker's," "wine-drinker's," and "whiskey-drinker's" noses are of this class. In some cases there is a uniform and symmetrical hypertrophy of all the soft parts of the nose, which may thus attain colossal proportions. It is these extreme consequences of acne rosacea to which the term *Rhinophyma* has been applied.

The course of the disease is slow, and in the larger number of patients does not produce the exaggerated types of the second and third grades. The lesions may persist indefinitely as indolent symp-

toms of the malady in any one of its stages, or in a case in which there has been no new-growth of vessels or of tubercles may proceed to spontaneous involution.

The *Rosacea Acuminata* of Crocker is characterized by the development on the face of few or numerous, pinhead-sized, convex, red papules with an occasional seropurulent apex. The description given suggests Folliculis (*q. v.*).

Etiology.—The first and second grades of acne rosacea are common in women either at puberty or near the period of the menopause, in those who are pregnant, or in those who suffer from utero-ovarian disease, irregular performance of the menstrual function, or chlorosis.

The disease is seen also in men of early and of late adult life. In both sexes it may occur in anæmic and asthenic states; in both, also, its association with gastro-intestinal dyspepsia, constipation, and the immoderate use of strong tea and alcoholic drinks—beer, wine, and spirits—is a matter of common observation. The new-growth of vessels and tubercles, with the rhinophyma of the advanced grade of the disease, is much commoner in men than in women. In those whose faces are bronzed by exposure to the weather the telangiectatic condition of the cheeks, rather than of the nose, is of frequent occurrence. Veteran sailors and soldiers are thus commonly affected. Persons who have frozen the nose or the cheeks on one or more occasions and those suffering from trauma of these parts are similarly liable to telangiectases. Any externally or internally operating cause which tends to retard the capillary circulation in the superficial portion of the skin is capable of inducing this result, whether this retardation be due to direct or reflex vasomotor nerve action, or to toxines operating directly upon the vessel walls. Acne rosacea at times is displayed conspicuously in the mulatto.

Pathology.—In the first stage of acne rosacea there is merely passive hyperæmia. The circulation in the superficial capillary plexus is retarded. Persistence of this condition for long periods of time results in paresis of the capillaries, with their consequent dilatation and hypertrophy, phenomena which characterize the second stage, the sebaceous gland-disorder being a complication of the process. In the third stage the nodules are composed of newly formed gelatinous elements, which later are replaced by organized connective tissue.¹ Dilatation and hypertrophy of the sebaceous glands, with dilatation, hypertrophy, and new growth of the superficial blood-vessels, and enlargement of those trunks which ascend from the corium are also found. There is no marked epithelial hypertrophy (Unna).

The disease, however, is viewed differently by authors. By some its obvious connection with acne vulgaris is denied; by others it is regarded as a seborrhœal eczema. According to Besnier and Doyon, this disease represents the following: superficial or deep, at first intermittent, then persistent, hyperæmia; sebaceous hyperæmia (acne-

¹ For histopathology of the severe type—rhinophyma—see Salzer, Archiv, 1901, lviii., p. 409 (with review of literature).

eczema), in which there are unquestioned steatorrhœa and implication of the sebaceous glands with infiltration and possibly exfoliation of the skin; deep hyperæmia with infiltration of the corium and plastic products about vessels, follicles, and perifollicular tissue; telangiectases, as described above; and hypertrophies of the perifollicular derma with connective-tissue new-growth.

Diagnosis.—Acne rosacea is distinguished from acne vulgaris by the presence of telangiectases, and of the hypertrophic growths which characterize fully developed lesions. The tubercular syphiloderma is recognizable by its tendency to ulceration and crusting and by the entire absence of telangiectasis. When the tubercles of syphilis are limited to the extremity of the nose (they are usually small in consequence of the influence of treatment) they often degenerate into characteristic, split-pea-sized, irregularly circular ulcerations, which are superficial in seat and frequently isolated. They leave similarly shaped and sized depressed cicatrices at the tip and neighboring parts of the nose. As the process is much more rapid than in acne rosacea, these lesions, considered in connection with the absence of telangiectasis, furnish the most significant diagnostic symptoms of the disorder, for they often occur late in the history of syphilis, in individuals in middle life, and in varying shades of a dull-reddish color, circumstances particularly favorable for confusion regarding the identity of the two diseases. Asymmetry of lesions more frequently characterizes syphilis than rosacea.

Zoster from involvement of the superior maxillary branch of the trigeminus, with diffused redness of one side of the nose and efflorescence of vesicles over its tip and ala, strongly resembles acne rosacea with pustular lesions; but in zoster the painful character of the disorder, its limitation to one side of the face, its transitory career, and its vesicular lesions are characteristic.

Lupus vulgaris, like syphilis, when occurring upon the nose, is to be recognized by the tendency of its papulo-tubercular lesions to ulceration and crusting, by the absence of vascularity, and by the frequent presence of characteristic cicatrices. Unlike syphilis and acne rosacea, however, the history of lupus vulgaris usually extends from early childhood. Lupus erythematosus is characterized by a definite outline, by a superficial infiltration and elevation of the border of the patch, by an atrophic or scarred centre, by adherent scales, and by its symmetrical diffusion over much larger and defined areas, commonly extending from the bridge of the nose well on to the cheeks.

Treatment.—So far as there can be said to be any internal treatment of acne rosacea, it is that employed in acne vulgaris; but in neither disease can such treatment be confidently described as effective in the dispersion of the local lesions. The treatment is that of the patient rather than of his disease. When alcohol has been in any degree productive of the local effects the use of spirits, wines, and beer is to be interdicted; but as regards confirmed rosacea this prohibition

will prove to be of little avail. The disease when resulting from spirit-drinking may persist after years of total abstinence.

The diet should be of the character proper for the patient with acne. All imbibition of hot liquids, even tea and coffee in excess, should be restricted as tending to congest the blood-vessels of the face. Everything having the same result in the habits, the occupation, or the clothing of the patient should be, as far as possible, deprived of influence, as, for example, wearing of tight collars and corsets, working over hot fires, etc.

In many patients who are the subjects of rosacea, as distinguished from the younger class of sufferers from acne vulgaris, there are evidences of lithæmia, gout, and similar conditions, requiring even stringent rules in many particulars for the conduct of life. The use of sugar in many of these cases is to be restricted, meat should be forbidden or permitted but once in the day, and other articles of food be selected with special care. Tobacco should never be allowed to male patients with well-marked symptoms, and the daily general bath described in the preceding chapter as of importance in the treatment of acne should here also be prescribed.

All gastro-intestinal sources of mischief should also be set aside when practicable. In acne rosacea, even more than in acne simplex, dyspepsia and constipation are conspicuously effective factors.

Internally, nux vomica, ergot and ergotin, ichthyol (ammonio-sulphonate), mineral acids and alkalies, and arsenic have been recommended. Most of these drugs are valueless in removing the symptoms of the disease unless their use is indicated by the general condition of the patient. In gouty patients blue pill and alkalies, though not of themselves capable of relieving the rosacea, may serve to aid the patient; the same may be said of the use of iron in chloro-anæmic women.

The local treatment of acne rosacea is substantially that of acne vulgaris. Stimulating lotions of green soap, formalin, alcohol, mercuric chloride, or sulphur (Vlemineckx's solution is especially serviceable), in connection with ablutions in hot water, are of the highest value. In addition, the various ointments containing sulphur, resorcin, mercuric oxide, and iodides, and the continuous application of mercurial plaster should be employed if necessary.

One of the most effective local treatments is by employment of radiotherapy. Under its use the nodules and diffuse redness as a rule disappear rapidly (for technique, see *Acne Vulgaris*). Telangiectases are not removed by the *x*-rays, but yield as a rule to phototherapy.

Phototherapy in a similar number of cases has given equally brilliant results, and is preferable to the *x*-rays for circumscribed areas. When the disorder is more extensive, the results are achieved more rapidly and inexpensively with the *x*-rays.

Van Harlingen reports rapid results from the application, several times in the day, of a lotion composed as follows:

R	Sulphuris præcipit.,	5j;	4
	Pulv. camphoræ,	gr. v;	33
	Pulv. tragacanth.,	gr. x;	66
	Aq. calcis, }	āā f5j;	āā 30 M.
	Aq. rosæ, }		

Fox, of New York, applies chrysarobin in traumaticin, $\frac{1}{2}$ drachm (2.) to the ounce (30.); but this drug should be reserved for intractable cases, as it may produce severe dermatitis. After the production of these effects, however, the benefits secured may be appreciable for months.

In the second stage of the disease the treatment is the same as in the first stage, but when all the inflammatory phenomena have yielded and the causes of the local congestion have been removed, the vessels and remaining nodules may be destroyed by single or by multiple puncture of each with a fine cambric needle attached to the negative pole of a galvanic battery with six to ten elements in the circuit. This operation is better than the knife, and it may be regarded to-day as the effective method of removing blemishes produced by dilated blood-vessels in this stage of rosacea. The method is simple, readily executed, requires no anæsthetic, and is in many ways superior to other methods, to which resort should be had when electrolysis cannot be employed. Some vessels may be destroyed completely with the production of so slight a cutaneous cicatrix that in the course of a few months it cannot be recognized by the unaided eye.

For details of this simple operation the reader is referred to the chapter on Hypertrichosis. For the cambric needle may often be substituted with advantage a platinum hypertrichosis needle. The vessels may be entered in one or several places, and the operation be repeated until the last thread-like evidence of their existence has disappeared. The number of cells brought into the circuit must be graduated somewhat to the requirements of each case and to the locality of the skin operated upon. Fewer cells can be tolerated for the lip and alæ nasi than for the root of the nose, the cheeks, or the forehead.

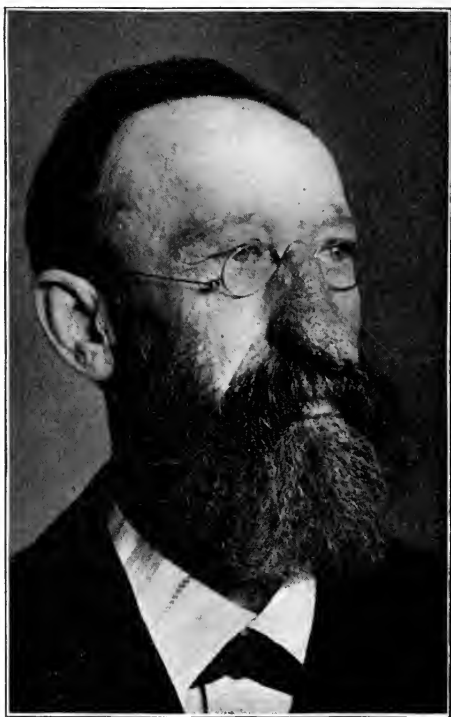
Brushing the part cautiously with solutions of caustic potash, from 10 to 30 grains (0.66–2.) to the ounce (30.) of water; and the local use of pure carbolic, chromic, pyrogallic, and glacial acetic acids, acetum cantharidis (Taylor), sulphur iodide, or solution of mercury pernitrate are forms of treatment which have been recommended but it is needless to say that use of such powerful agents must be attended with the utmost caution. Before these drugs are employed an effort should be made to produce exfoliation by spreading over the part a plaster made of green soap. Unna's mercurial plaster-mull is similarly applied. Kaposi highly recommends the solution of iodated glycerin employed by him in acne vulgaris (*q. v.*),

which solution is painted over the part from eight to twelve times daily for three or four successive days, and is immediately covered with gutta-percha tissue.

Multiple scarification of all new-growths of the third stage after the manner of attacking lupus-nodules, erosion with a dermal curette or with a Braun spoon, and surgical ablation or decortication of tumors by ligature and knife, are also available. After any destructive attack upon the diseased portions of the skin soothing lotions, fomentations, or ointments should regularly be applied.

Prognosis.—A favorable prognosis can be given in cases in which the disease occurs in its milder forms. Even in cases complicated by marked telangiectasis and hypertrophy the results of treatment are often in the highest degree encouraging. Notwithstanding the most

FIG. 188.



Rhynophyma.

energetic procedures, however, the *vis-a-tergo* of passive hyperæmia, involving often the deeper and unassailed blood-vessels, may work its slow progress. For women the future is in general more promising than that of men. With the most unfavorable prognosis, however, it is to be remembered that the disease is one of deformity rather than of physical discomfort.

ACNE VARIOLIFORMIS.

(ACNE FRONTALIS, ACNE RODENS, ACNE NECROTICA, ACNE ATROPHICA, FOLLICULITIS VARIOLIFORMIS, NECROTIC GRANULOMA. *Fr.*, MILIAIRE SCROFULEUSE, FOLLICULITE CICATRICIELLE NÉCROTIQUE.)

Symptoms.—Acne varioliformis is characterized by the occurrence over the brow, scalp, or other regions, of discrete, exceedingly indolent, reddish-brown, papulo-pustular, often umbilicated, lesions, which become covered with crusts, and eventually leave depressed superficial scars resembling those of small-pox. This disease is not to be confounded with that to which Bazin and other French writers once gave the name *Acné varioliforme*, viz., molluscum epitheliale (*molluscum verrucosum*, of Kaposi).

The disease is relatively rare, and may be characterized by the development of few (but one or two) or very many lesions. In some instances the peripheral extension of a single papulo-pustule may produce a narrow annular sero-purulent chamber with a depressed firm centre. There is commonly a well-marked coincident

FIG. 189.



Acne necrotica.

seborrhœa. Many of the lesions are traversed by lanugo-hairs. The subjective sensations are slight, at times there is itching. The disease tends to recur and is exceedingly chronic in course.

In exceptional cases the disorder occurs in other regions than those

named above; for example, over the dorsal and sternal aspects of the trunk, about the nose, and within and about the concha of the ear, the interscapular region, and the extremities. In one of the author's patients (the subject of the accompanying illustration) the disease left very disfiguring scars on the right ala of the nose. In some cases the affected regions are invaded so thickly that the resulting scars produce a cribriform aspect in the integument. Occasionally the arrangement of the lesions is linear or circinate.

The variations displayed are exceptional, but worthy of note. Severe confluent, serpiginous, and very extensive developments of the malady may be seen. According to Boeck, the hue of the papulopustule is due to minute capillary hemorrhages, which later become invisible in consequence of tumefaction of the overlying integument.

Etiology.—The sexes are represented nearly equally among the subjects of the disease, who are, as a rule, in or near middle life. Gastro-intestinal disorders are believed to have some etiologic relation to the disorder. The causes of the disease are obscure, but that its origin, together with necrotic granuloma and folliclis, is in part microbic, is well-nigh established.

Pathology.—Fordyce¹ and Sabouraud state that the disease begins in the upper part of the hair-follicle, from which point it extends to the entire follicle and to the sebaceous gland. Various micro-organisms are found in the lesions, but the active agent is apparently a staphylococcus. Sabouraud² believes the disease is always preceded by seborrhœa due to infection with his micro-bacillus.

The histological changes are similar to those of ordinary acne except that the process is limited distinctly in extent and almost invariably terminates in a small central area of necrosis and subsequent scar-formation. Some of these cases may be due to the presence of the toxins of tubercle-bacilli. Acne varioliformis occurs in typical development upon the faces of the tuberculous. For further details in this connection, the paragraphs devoted to the Paratuberculoses of the skin (Necrotic Granuloma, Folliclis, etc.) should be consulted.

Diagnosis.—The lesions are to be distinguished from the syphiloderm named above, from acne vulgaris, and from variola. The points of distinction are: the absence of fever, present and precedent; the absence of other symptoms of syphilis; the localization of the eruption; and the absence of intermingled comedones and other symptoms of acne disseminata. The involvement of the scalp-surface is not alone sufficient to distinguish it, as syphilodermata and occasionally comedones are visible in the scalp above the brow.

Treatment.—As a rule the disease yields readily after the use of antiseptic lotions or of ointments containing white precipitate, resorcin, sulphur, mercuric chloride, formalin, or boric acid, though lesions are likely to develop after suspension of treatment. In severe cases caustics or galvano-puncture may be required. Crocker employs potassium iodide internally with happy results.

¹ J. C. D., 1894, p. 152.

² Annales, 1899, s. iii., x., p. 845.

THE HAIR AND HAIR FOLLICLES.

HYPERTRICHOSIS.(Gr., *ὑπὲρ*, in excess; *θρίξ*, hair.)(HYPERTROPHY OF THE HAIR, SUPERFLUOUS HAIR, HAIRINESS, HIRSUTIES, HYPERTRICHIASIS, POLYTRICHIA, TRICHAUXIS. *Fr.*, POILS ACCIDENTELS.)

In the condition of hairiness the pilary filaments may be increased in number or size, or be developed abnormally with respect to the region or age of the person who is the subject of the anomaly.

FIG. 190.



The Russian "Dog-faced Man."

Symptoms.—Hypertrichosis may be congenital or acquired, and partial or universal. In congenital hairiness it is common to see infants at birth with extremely long hairs on the hairy part of the body, this growth being usually replaced later by shorter filaments. Partial congenital hirsuties is illustrated in pigmentary nævi. Universal congenital hirsuties is a rare deformity, the entire body then being covered with longer or shorter downy hairs of various colors.

Remarkable instances of universal congenital hirsuties are observed occasionally. The so-called "Russian dog-faced man" (Andrian Jeftichjew) and his son were noteworthy illustrations of this anomaly. In most cases the influence of heredity is distinct and often is accompanied by defective dental development, such as entire absence of molar or of canine teeth. This anomaly may be exhibited in generations of one family.

Acquired hirsuties may be partial or universal, much more commonly the former. Thus, the hairs of the scalp or the beard may acquire an enormous vigor and length, reaching to the ground when

the body is in the erect position; or the hypertrophy of the hairs may affect the face of the child or the woman; and in persons of the sex last named either the upper lip, chin, cheeks, or all portions of the body usually covered by hairs in man, may be provided with a vigorously and symmetrically developed pilary growth.

In all cases of hypertrichosis, whether congenital or acquired, the parts normally unprovided with hair are not the seat of the pilosis. The hairy regions in these cases may be provided with a few or many follicles, each of which is the seat of two, three, or even more filaments.

As the growth of the beard in man is more or less associated with the maturity of the sexual organs, so the hypertrichosis of women and children is at times related to a precocious, perverted, or arrested function of the generative organs. The reported instances of menstruation in female infants and children usually include a description of abnormal pilary development about prematurely developed pudenda; and after the climacteric period, when some women conspicuously in external appearance begin to resemble individuals of the opposite sex, either isolated, thick, bristle-like hairs develop over the chin or lips, or the extreme hirsute condition may be reached. Duhring¹ reported one such case, which is illustrated by a lithograph representing the face of a woman provided with a superb beard.

The influence of the sexual organs in the hypertrichosis of women is well demonstrated in the following case coming under our observation:

A married woman, thirty-three years of age, weighing one hundred and fifty pounds, mother of three healthy children, applied for relief of a general and facial hirsuties which had resulted in the growth of a full beard and moustache. She had not menstruated for more than a year, and had been pronounced by an expert to be past the climacteric. During 1884 and 1885 the hairs of the face were removed in successive operations by the electrolytic method described below. Menstruation began while she was subject to the influence of the galvanic current in the operating-chair, and continued thereafter irregularly, at times with intense pain and even menorrhagia. In 1886, after the last of the operations on the face, she rather suddenly lost in weight, decreasing to one hundred pounds, and began to menstruate regularly and painlessly. The hypertrichosis of the general surface then spontaneously disappeared. In the latter part of the year she again conceived, and in March, 1887, being then free from hirsuties, she brought a healthy male child into the world.

Halbau² has described hypertrichosis graviditatis as a symptom of pregnancy.

As the result of the persistent application of stimulating and oily liniments over a region of the body (scapula, sacrum, sciatic notch,

¹ Arch. of Derm., 1877, iii., p. 193.

² Wiener klin. Wochenschrift, 1906, p. 6.

etc.), as also after traumatism by pressure or otherwise, a growth of long and numerous hairs is often produced. Care should be had in the management of cases of acne and rosacea in the persons of dark-skinned young women with luxuriant hair upon the head, lest a similar growth be produced upon the chin, cheeks, or nose.

In cases of hypertrichosis the hairs may be colored variously, and the hypertrophy of downy hairs purely be numerical, or result in increase in the actual size of the shaft of the individual filaments. In neither case do the hairs present any anatomical peculiarities of structure. The localized congenital form of hirsuties is often characteristic of certain moles, known as *nævi pilosi*. The surface of pigmentary moles (*nævi pigmentosi*) is often very extensively covered with hairs of a dark color. Singular anomalies have been figured in which extensive regions (one or several limbs, the entire back, even the greater part of the body) were the seat of enormous pigmented moles, covered with warts, fibromata, and other benign tumors, and clothed with a thick covering of longer or shorter hairs.¹ All such cases exhibit a striking development in either symmetrically or asymmetrically disposed areas of distribution of cutaneous nerves.

HYPERTRICHOSIS NEUROTICA.—The hypertrichosis neurotica of authors is that condition in which an excessive growth of hair has succeeded spinal paralysis and other morbid conditions of the nervous centres. Under the title Trophoneuroses of the Skin in this work are described changes of a similar kind, in which there is association of hypertrichosis with hyperidrosis, changes in the nails, and even extensive tylosis of the palms and soles.

PLICA POLONICA.—This was formerly supposed to be a disease peculiar to Poles (whence its name), but which has long been recognized as a result merely of persistent neglect, filth, the invasion by parasites, and consequent exudative disorders of the scalp. When it exists the hairs form a huge matted mass on the crown of the head. Hebra devotes an interesting chapter to the superstitious awe with which this accumulation of hairs, lice, and filth has been regarded. In Alaska a number of cases of plica have been observed among the natives of that region. A typical case of this deformity was lately presented at our clinic.

NEUROPATHIC PLICA.—Le Page² described a case in which tangled "lumps" and "festoons" of hairs, flat, curled, looped, and intertwined appeared on one side of the head of a girl seventeen years old, who had previously suffered from neuralgic pains in the site of the growth. Similar cases have been reported by Stelwagon³ and others.

TRICHIASIS is that condition in which the eyelashes, diverted from the normal line of projection, are turned inward so as to irritate or wound the conjunctival membrane. In **DISTICHIASIS** a double row of

¹ See the author's case of *nævus lipomatodes* in a child, the pilary growth being at that age undeveloped. *J. C. D.*, 1885, iii., p. 193.

² *Brit. Med. Journ.*, 1884, i., p. 160.

³ *Diseases of the Skin*, 5th ed., p. 908 (bibliography).

filaments can be recognized, which are liable to induce similar ocular distress.

Etiology.—The causes of hypertrichosis are obscure. Whatever determines the blood in excess to any region of the body supplied with hair-follicles indirectly may be the cause of hypertrophy of hair, a fact demonstrated in patients who, after applying sinapisms or liniments for years to the skin over the seat of a rebellious neuralgia, exhibit in this region an abundant growth of hair, often several inches in length. In women, whose sex renders the anomaly most deforming and distressing, it is noted, as has been observed, in precocious, perverted, or arrested activity of the sexual function. It may be a racial peculiarity, a family trait, an inherited anomaly, or an epiphenomenon in dwarfs, monsters, individuals affected with club-foot, insanity, and congenital deformities of several kinds. The neurotic conditions accompanying certain varieties of hirsuties may be inappreciable; or evidently be due to traumatism; or be exhibited in paralyses, muscular atrophy, etc.

Treatment.—To Hardaway, of St. Louis, Americans are indebted for the popularization of the method of removing superfluous hairs by electrolysis, first devised by Michel, of his city. Extensive pilary growths are now often removed by this method without subsequent reproduction of the hairs. A fine needle is introduced into the hair-follicle and gently passed down to the papilla at its base. This instrument is connected with the negative pole of a galvanic battery containing six or more elements, the positive pole of which is in connection with a sponge-electrode held in the patient's hand, who is thus enabled to make or break the circuit at will. When the current is passed a few minute bubbles of gas escape from the orifice of the follicle, and when the hair-papilla is destroyed the hair itself is readily extracted. The dexterity acquired by practice is requisite for the proper performance of the operation, with a view particularly to the insertion of the needle at the proper angle into the follicle. Few patients complain of pain. The number of hairs removed at a sitting varies with the sensitiveness of the patient's skin. The resulting scar is quite imperceptible or far less disfiguring than the hirsuties, suggesting the appearance of the male beard after shaving. Transitory macules, papules, pustules, and wheals occur at the site of puncture. Care should be taken not to insert the needle too deeply in the particularly vascular regions of the face, as an aneurysmal tumor might be produced as a consequence.

Every detail of this exceedingly simple operation has now been carefully studied by American operators, and the results, as confirmed by our experience, may be given as follows:

1. Any good galvanic battery may be employed. We use habitually a forty-cell stationary battery, the switchboard of which is so arranged that any number of selected cells may be brought into the circuit. A galvanometer should be placed in the circuit indicating a current of from one-half to four milliampères. The number of cells

employed should vary with different individuals, different parts of the face, and on different days with the same individual—*e. g.*, a smaller number is required when a patient previously operated upon returns after a somewhat long period of rest. Two to four cells only may be tolerated over the tip of the nose or the upper lip near the septum nasi. Twelve to twenty may be well borne, after some experimenting, on an insensitive chin.

2. The best needle is a carefully selected, fine jeweller's broach, its shaft and point being annealed by rapid passage through the flame of an alcohol lamp. It is often useful to have the point also well rounded on an emery-wheel. Iridio-platinum needles are useful, but inferior to a broach for general work.

3. The needle-holder should be simply a convenient insulated handle, sufficiently long to protect all the points of the operator's right hand from the current, and should be as light as possible, since a heavy holder interferes with delicacy of touch. Duhring's¹ holder, which is of the shape of a thin lead-pencil or pen-holder, is about four inches in length. The handle, or stem, is of hard rubber, through which passes a metallic rod, acting as a conductor for transmission of the current. The needle is inserted into the needle-holder proper, which is slotted, the needle being clamped immovably by means of a screw-nut. In the other end of the stem is an insulated inserting-pin attached to the cord leading to the battery. The instrument is convenient to handle and altogether well adapted to the operation.

4. The patient should be seated or reclining at ease in a good light, with the handle of the electrode connected with the positive pole of the battery in one hand, ready to press the sponge into the palm of the other. In this way, at the bidding of the operator, the patient makes and breaks the circuit at will. The sponge attached to the holder should be wet with a solution of salt and water.

5. As to further details of the operation, it is well (*a*) to make and break the connection only when the needle is *in situ*, as this diminishes the pain of the operation; (*b*) to introduce the needle with a gentle manipulation (acquired only by skill and well characterized by Hardaway as a "catheterization" of the hair-follicle), observing a certain degree of parallelism with the hair-shaft as the needle enters; (*c*) to operate leisurely, making sure that the current is not broken by separation of the hands of the patient before the hair is completely free in the follicle. This last can be ascertained by gentle traction on the shaft in from twenty to forty seconds after insertion of the needle; (*d*) to operate in succession upon contiguous hairs when practicable, not selecting one here and one there, the latter course being productive of greater pain; (*e*) never to use the positive pole in connection with a steel needle, an error which results in the production of unsightly pigmented blemishes on the surface of the skin.

The previous employment of preparations of cocaine both hypodermatically and by inunction—*e. g.*, cocaine oleate—to relieve or

¹ Amer. Jour. Med. Sci., 1881, lxxxii., p. 142.

diminish the pain of the operation, may be followed by exceedingly unpleasant consequences. A dermatitis thus induced may persist for months.

Prince, of Boston, lays stress upon the accurate regulation of the current by the aid of the absolute galvanometer, which we have found in practice useful but not essential. Fox,¹ of New York, reports a gradual decrease in the number of hairs returning after operation, proportioned to the improvement in the instruments and the skill of the operator. The percentage of such returns varies with these conditions.

All patients affected with hirsuties are not to be advised the operation. We have declined to operate in many cases which were not deemed to belong to the class in which the best results of the operation may be expected. Young and vigorous women, usually unmarried, may point out hairs to be removed that are merely full-developed filaments of a thick downy growth, all the hairs of which are rapidly pushing to equal maturity. Here the operation itself, by inducing hyperæmia of the skin, may simply hasten the hypertrichosis actually in progress, and thus aggravate the disorder. In most cases, when an operation is undertaken, both parties should fully understand the possible issue. It is a question whether it lies within the legitimate sphere of the physician to remove superfluous hairs from the habitually covered breasts and arms of women.

This operation has unfortunately found its way into the hands of the unprincipled and the ignorant, who, in their efforts to extract money from the credulous, have in some of the larger cities brought electrolysis for hypertrichosis into ill repute. The operation is, however, all that can be desired if only it be performed with sufficient skill and conscientiousness; but if hairs are rapidly plucked away from their follicles while an electric current is passing merely, the return of each filament is prompt and mortifying to the patient. It should, therefore, be understood as a procedure requiring ample time on the part of the operator, and either fairly good vision or eyes aided by a mounted lens. Not more than from forty to sixty hairs can be removed in an hour by an expert operator; and there are few who can work with advantage more than one hour at a sitting, or more than one or at most two hours in a day.

Hairy nævi may be removed by complete excision, but removal of the hairs by electrolysis will sometimes result in disappearance of the entire growth without such operation.

In 1897 Freund² reported that he had succeeded in removing the hairs from a large hairy nævus by using the *x*-rays. The method was developed further by Schiff and Freund,³ and has been employed since by many observers, including Benedikt, Ehrmann, Jutassy, Pusey,⁴ and ourselves.

¹ The Use of Electricity in the Removal of Superfluous Hair, etc., Detroit, 1886.

² Wien. med. Wchnschrft., 1897, xlvii., p. 428.

³ Ibid., 1898, xlviii., p. 1058.

⁴ Pusey-Caldwell, The Roentgen Rays in Therapeutics and Diagnosis, Philadelphia, 1903, p. 339 (with bibliography).

After many years' observation of patients subjected to radiotherapy for removal of superfluous hair, the author has abandoned its use. While in some cases the result is satisfactory alike to physician and patient, the probability of future telangiectasia is so great as to be prohibitive of its continued employment.

Depilatories for the removal of superfluous hairs operate by the destruction of the filament without obliteration of the papilla. The consequence is that the hairs are reproduced in the course of about a fortnight. Most of the compounds used for this purpose contain either calcium sulphate, arsenic sulphate, or barium sulphide, made into a paste with warm water. This paste is applied over the hairy surface with a spatula, and is permitted to remain until it dries, or produces a sensation of heat or burning, a period usually requiring ten minutes. It is then rapidly removed by scraping with a spatula, and the surface thoroughly cleansed with warm water, after which the skin is anointed with cold-cream salve or other similar unguent.

Of these depilatories Duhring recommends the following:

℞	Barii sulphidi,	5ij;	8	
	Pulv. oxid. zine., }	āā 5iij;	āā 12	
	Pulv. amyl., }			M.

To be prepared in form of an impalpable powder, which, just before using, is to be mixed with water to form a thin paste.

The following are formulæ devised by French authors:

℞	Sodii hyposulphit.,	5iij;	12	
	Caleis, }	āā 5x;	āā 40	
	Amyli pulv., }			M.

To be finely triturated, and, when used, to be made in a thin paste with water. (Boudet.)

℞	Caleis,	5j;	4	
	Sodii carbon.,	5jss;	6	
	Cerat. adipis,	3j;	30	M.

To be applied as a depilatory in the manner of a paste.

All these formulæ require caution in their use, and they should rarely be intrusted to patients themselves.

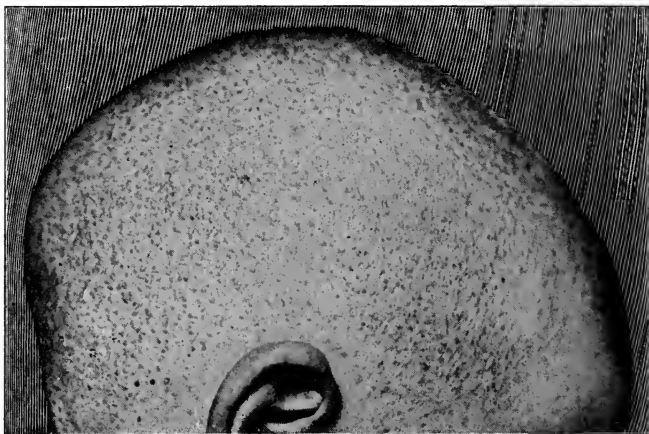
Shaving may be practiced upon the hirsute face of women, and, with a similar end in view, also epilation; the latter, particularly in cases of hypertrophy of the hair limited in extent. Partial success has attended the thrusting into the follicles of needles previously dipped in caustic solutions, or heated in various degrees, but these methods are inferior to electrolytic destruction of the hair-papillæ. The hairs may be rendered less conspicuous by bleaching them with frequent applications of hydrogen peroxide. Bulkley states that a thorough use of this remedy retards the growth of fine hairs.

ATROPHIA PILORUM PROPRIA.

(ATROPHY OF HAIR.)

Atrophy of the hair may be either symptomatic or idiopathic. Illustrations of the first-named condition are observed in phthisis, syphilis, seborrhœa, parasitic affections of the scalp, and in almost all

FIG. 191.



Congenital atrophy of hair.

general diseases interfering with the nutrition of the pilary growth. The filaments then become dry, lustreless, friable in both longitudinal and transverse diameters, and diminished in each dimension.

There are several recognized forms of idiopathic atrophy of the hair. One of these forms exists in those long hairs which are seen to be irregularly thinned or flattened in the shaft, and split at the point into two or more recurving fibrillæ, a condition noted, for the most part, in few hairs scattered among those of full development and vigor. This especially localized atrophy seems to be peculiar to one or more follicles merely; and is analogous to the condition in which there appears among the vigorous pigmented hairs of early life a single blanched filament.

FRAGILITAS CRINIUM.¹

Under this title a number of disorders, due to atrophy, and producing fragility, splitting, or curling in abnormal directions of pilary filaments, have been described by authors.

Under the title: "UNDESCRIBED FORM OF ATROPHY OF THE HAIR OF THE BEARD" Duhring² reports an affection in which, either at the bulb or at a variable distance from it but within the follicle, there is

¹ See Jackson, *Diseases of the Hair and Scalp*, New York, 1890, and J. C. D., 1903, xxi., p. 473.

² Amer. Jour. Med. Sci., 1878, lxxvi., p. 88.

fission of the hair-filaments into from two to four stalks with coincident atrophy of the bulb itself, and consequent irritation of the surface. Duhring's patient exhibited to a marked degree the species of hypochondriasis to which the subjects of disease of the hair seem specially prone. This disorder is not induced by a parasite.

In 1887 a gentleman applied to us for advice who was in a fair condition of general health, but the hairs of whose beard exhibited the symptoms described and figured by Duhring. Photo-micrographs of specimens of these hairs show clearly that in every case the fission of the filament extended completely to the base of the follicle and produced there irritation. The hairs over several square inches of surface were thus uniformly affected, normal filaments being in such areas absent. The interfollicular spaces, however, seemed to be abnormally widened, as though in these areas such normal hairs might have fallen in consequence of a species of alopecia. The disease was much more strongly marked on the chin than on the cheeks or the upper lip. The curling of some of the splinters was complete and characteristic. In Parker's¹ case there were similar features.

When the fission exists solely at the free ends or in the shaft of the hair, the morbid condition is obviously different from that described above. Several, many, or all of the hairs may be affected, the splitting extending only a short distance from the point of the filament, or many inches beyond. The splitting of the shaft of long hairs in women without involvement of the point is due most commonly to the thrusting of sharp-pointed hair-pins through the hair-coils on the scalp, a single thrust being thus capable of wounding a large number of hairs in a single braid.

In one form of this affection the hairs break off short when energetically brushed with the hand. The possibility of the defect in hair development being due to keratosis pilaris should be carefully considered.

The treatment of these conditions is primarily hygienic as regards both the general health of the patient and the preservation of the hair from artificial methods of management (hot ironing, curling, singeing, crimping, and wounding with hair-pins).

Locally, stimulation with shampoos, and inunction with bland oils, and simple remedies are useful. The region of the beard when affected should be shaved regularly.

TRICHORRHEXIS NODOSA.

(TRICHOPTILOSI [Devergie], NODOSITAS CRINIUM, TRICHOCLASIA, CLASTOTHRIX.)

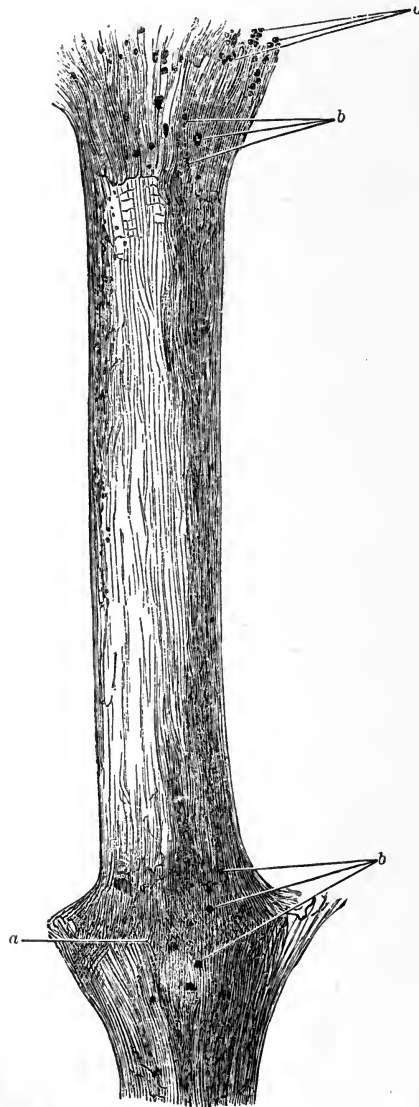
Trichorrhesis nodosa is a disorder of the hairs, first described by Wilson in 1849, and since that time it has been the subject of extensive discussion. It affects the male beard mostly. The diseased

¹Brit. Med. Jour., 1888, ii., p. 1335.

hairs show one or more nodular enlargements which on careful examination are seen to be due to partial transverse fracture of the hair shaft.

Extensive bacteriological studies of the diseased hairs have been made with negative result and it has been found to affect bristles of

FIG. 192.



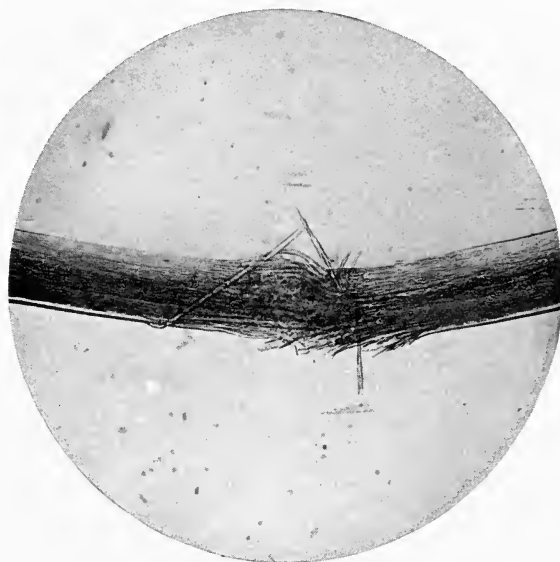
Trichorrhexis nodosa. (After SCHWIMMER.)

hair brushes. Sabouraud¹ concludes that the disease is a fracture of the hairs of the beard and of brushes due to mechanical friction and

¹ Annales, 1903, s. iv., iv., p. 947.

the use of lather. Brocq produced the disease in his own beard by friction.

FIG. 193.



Trichorrhexis moniliformis. (HEIDINGSFELD.)

The only treatment necessary is to discontinue the constant use of the hair brush.

MONILETHRIX.

(MONILIFORM, BEADED HAIRS; PILI ANNULATI. *Ger.*, RINGELHAAREN; *Fr.*, APLASIE MONILIFORME INTERMITTENTE.)

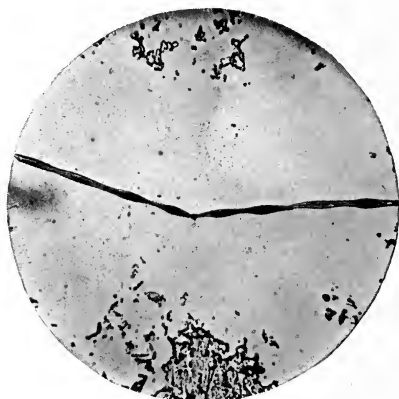
Monilethrix is a somewhat rare condition first observed by Smith (as described below), and since by numbers of others, including Luce, Anderson, Crocker, Lesser, and Behrend.¹ A patient affected with this disease was exhibited at the International Congress of Dermatology held in London in 1896. Like the forms of fragility described above, the hairs are peculiar in exhibiting along the shaft a succession of rings or nodes, between which are narrower portions of the shaft, of a color lighter than that of the pigmented nodules or annular portions. The result is a characteristic checkered appearance of the hairs, often associated with alopecia in varying grades. Fracture always occurs in the internodular part, the fractured extremity having a characteristic brush-like stump. These conditions are due to atrophic changes in the internodular parts, with better development in the pigmented and thicker portions of the shaft, the whole being due to nutritive changes which Virchow, Hallopeau, and others explain as due to a periodic aplasia of the hair-papilla. The obvious

¹ For complete bibliography, see Gilchrist, J. C. D., 1898, xvi., p. 157.

symptoms are clearly the result of a profound process, originating probably in the trophic nerves.

The disease is believed by Brocq and also by Hallopeau to be a manifestation of keratosis pilaris. It is most frequently seen in

FIG. 194.



Trichorrhæxis nodosa. (HEIDINGSFELD.)

succeeding generations of a family and also in individuals affected with the disorder. The bacteriology is negative.

The treatment is through general and local improvement of the nutrition.

NODOSE SWELLINGS OF THE SHAFTS OF THE HAIR.

Smith,¹ of Dublin, first reported a case of this disorder. Photomicrographs of some of the hairs from this patient exhibit no fragility at the nodes, which beginning near the scalp are displayed regularly along the shaft, the fracture being always internodular. The spherical swellings along the shaft are also pigmented in a brown hue, and these pigmented nodose swellings, contrasting with the non-pigmented color of the unaffected portions of the shaft, give the hairs a singularly "checkered" appearance. No parasite is discernible in any of the specimens.

Expansions and Fissures of the Hairs.—Michelson, under this title, discusses the abnormalities of the pilary system, instances of which are cited above, and he concludes as to the most of them that they are not separate diseases, but are expressions of an abnormal dryness and brittleness of the hairs due to atrophy. Cases of broom-like fissuring and division of the shaft into the larger longitudinal splinters he regards as equivalent processes, both beginning by a cuticular loss and often merging into each other.

This view may be sound with regard to a number of these rare affections; but even a superficial examination of the longitudinal

¹ Brit. Med. Journ., 1880, i., p. 654.

splinters shown in Duhring's and the author's cases reveals the fact that the shaft represented by the sum of all its splinters is greater than that of the average hair in diameter and circumference. Even the naked eye can recognize this fact. The separation of the epilating-forceps in seizing a single hair, in the case of our patient, was equivalent to the grasping of as many sound filaments as are represented by splinters.

The therapy of these cases is not well determined. Michelson believes shaving to be useless, and he recommends systematic shampooing and oiling. Arsenic internally is worth trying in all cases in which it is not contraindicated.

LEPOTHRIX.

(Gr., λεπίς, scale; θρίξ, hair.)

(TRICHOMYCOSIS NODOSA, TRICHOMYCOSIS PALMELLINA.)

This disorder, first described in 1869 by Paxton, and since recognized by Patteson, Pick, Babès, Barthélemy, and others, affects the hairs, chiefly of the axillæ and the genital regions. The filaments are dry, brittle, roughened, and loosened in their follicles. Under the microscope the shaft is seen to be either for a great part or for the entire length ensheathed in a concretion which may here and there be interrupted by furrows—a diffuse form of the affection. In a nodose form there are irregularly placed spherical masses, isolated from one another and more numerous toward the point than near the implanted extremity of the shaft. Crocker describes also circular and well-defined masses, lying upon but not surrounding the shaft, three times the diameter of the shaft, and containing fibres of the cortex that had been split by the concretion. The fracture may be clean or be brush-shaped. The nodular masses are firm, gluey, well attached to the shaft, and reddish brown to blackish in shade. At times reddish sweat of the axillæ, due to micrococci, has been a coincident symptom.

The nodes are found to be made up of chains of spherical or of elliptical micrococci, which penetrate the cortical layers of the hair with ease in regions of considerable moisture and sweat. The micro-organisms at first obtain access by minute separations of the cuticle of the hair, and they eventually penetrate more deeply, breaking up the cortical portions. While thus multiplying, a homogeneous substance, similar to the chitine by which the louse fastens its eggs to the hair, forms the bulk of the concretion in which the colonies of cocci are lodged.

The treatment is by shaving and external applications of mercuric chloride (1:2000).

CHIGNON FUNGUS.

(BEIGEL'S DISEASE.)

This affection is discovered upon false hairs, which exhibit on their shafts dirty-brownish nodes, due to masses of parasites. The fungus has not definitely been distinguished. The nodes are strung irregularly along the shaft of the hair.

TINEA NODOSA.

(PIEDRA NOSTRAS.)

This disorder, first discovered by Morris and Cheadle,¹ and since reported by Crocker² and Thin,³ affects the hairs of the beard or the moustache. Nodular concretions are developed irregularly along the hair-shaft, the bulb remaining unaffected. Under the microscope the growth was recognized as an ensheathing mass which when the hairs were split penetrated below the cutis. It was seen to be made up of fungus-spores smaller than those of *tinea trichophytina*. The hairs are brittle and break or split.

The treatment is by shaving or clipping, with the application of parasiticides.

CANITIES.(Lat., *canus*, white.)

(TRICHONOSIS CANA, POLIOTHRIX, POLIOSIS, HOARINESS, GRAYNESS OR WHITENESS OF THE HAIR.)

Symptoms.—In this anomaly the hairs appear in all shades of whiteness, from dirty gray or yellowish white, to a steel-gray or silvery white. This may be either a general or a partial, congenital or acquired, physiological or pathological, prematurely, rapidly, or gradually acquired condition. General congenital whiteness of the hairs is seen in albinismus, where pigment has never colored the filaments. Partial congenital whiteness is occasionally seen in patches, limited in size and varying in color from pure white to a deeper hue, that from birth do not receive pigment in due proportion, thus contrasting with the pigmented filaments by which they are surrounded. This is sometimes a family peculiarity.

Physiological decoloration of the hairs in variable shades is the well-known result of advancing years. When premature, it may occur early in life and result from pathological causes or be due to individual or inherited peculiarities. It may occur gradually or suddenly; in the former case the hairs usually pass through varying shades of gray to white, and this at any period after (occasionally

¹ Lancet, 1879, i., p. 190.

² Dis. of Skin, 3d ed., p. 1176.

³ Lancet, 1882, ii., p. 742.

before) puberty, though commonly after middle life is reached. At first a few scattered hairs are bleached: then these multiply and so gradually the whitening occurs; in other instances the bleaching is general, symmetrical, and uniform. In yet other cases even in senile hoariness the canities is at first circumscribed, the hairs of one part of the scalp blanching before others, the hairs of the beard whitening before the scalp or *vice-versâ*. Recurrence to the darker shades is noted rarely. Leonard, of Detroit,¹ cites a number of curious instances in which changes of this sort have occurred. Generally, however, canities of advanced years is progressive and permanent, occurring earliest on the temples and the beard of man, then involving the vertex of the head. Finally, the hairs of the entire body-surface may undergo similar pigmentary loss.

The coloring of the hairs of the head is, to a greater extent than commonly is appreciated, subject to variation from the operation of external causes. Thus, washing the hair with alkaline solutions has a bleaching effect, while profuse sweating, inunction with fats, subjection to smoke, and the temperature-changes of the summer have the contrary influence, the last named being associated possibly with increased sweating in the hot season.

Cases of sudden blanching of the hairs, occurring, for example, in a single night, are sufficiently numerous and well authenticated to be admitted as among the rare possibilities of a clinical experience. Nervous disorders, both centric and peripheral, such as long-continued mental depression, melancholia, paralysis, neuralgia, and traumatism of nerves or of nervous centres, may be followed by more or less rapid, general or partial, and permanent canities. The same result may follow wasting disorders, such as typhoid fever, tuberculosis, syphilis, and malarial fever, in which cases, as distinguished from the others, pigmented hairs eventually may replace those which were white. The first hairs springing from a patch of alopecia areata in which repair is in progress are often white or whitish, and are replaced later by those of normal color. The pressure of a truss or of a corset has produced patches of vitiligo and canities.

Landois has shown that many instances of suddenly occurring canities depend solely upon the rapid appearance of air-bubbles in excess of the average number in the hair-shaft.

In the rare affection known as Ringed Hair the pilary shafts present alternately white and pigmented segments.

Etiology.—Whitening of the hair may be senile in origin, in which case it is customary to declare it to be physiological; or be due to heredity; to deficient nutrition or innervation of the hair-follicles; to functional or organic nervous affections (fright, facial atrophy, etc.); or to local chemical action upon the hairs. Premature canities in young adults is often associated with the occupations of life, being much commoner in men who from necessity have the head habitually covered and who yet lead sedentary lives.

¹The Hair, its Growth, Care, Diseases, and Treatment, Detroit, 1880.

Pathology.—The color of the hair is dependent upon the pigment situated in the matrix and between the horny cells, and upon the natural yellowish color of the dried horny cells. In source and character the hair-pigment is undoubtedly identical with that of the skin in general. This has been considered with chloasma. Decoloration of the hairs may be due to failure of supply or to removal of pigment; to unevenness of the hair-surface (by which light is refracted); or to air-bubbles between and within the fibre-cells. In senile and pre-senile decolorations there is commonly actual diminution of pigment. Rapidly occurring canities is ascribed to the sudden appearance of air-bubbles in quantity in the shafts of the hair. Alterations of color in the hairs are attributed to successive periods of activity and rest in the pigment-producing cells.

Treatment.—The chief means of remedying premature canities is by the action of dyes, which are, in the main, compounded with solutions of silver nitrate, lead acetate, and ferrous sulphate. The main objections to their use are the fact that the dyed hair never has the exact hue and lustre of naturally tinted filaments and thus rarely deceives the eye of the observer, as also the disagreeable coloring of the scalp which results from incautious use of the dye, and the consequent liability to irritation of the surface. These substances are not known to have a deleterious effect upon the general health. Kaposi gives the following formulæ for hair-dyes:

To obtain a black color—

℞ Argent. nitrat.,	gr. xv;	1	5	M.
Ammon. carb.,	gr. xxij;	1		
Unguent. adipis,	ʒj;	30		

Or

℞ Argent. nitrat.,	ʒj;	4	M.
Plumb. acetat.,	gr. xv;	1	
Aq. Cogn.,	gtt. xv;	1	
Aq. ros.,	ad fʒiij;	ad 90	

To obtain a brown shade—

℞ Acid. pyrogal.,	gr. xv;	1	M.
Aq. Cogn.,	ʒss;	2	
Aq. ros.,	ʒjss;	45	

Anderson first applies a lotion of mercuric chloride, 2 grains to the ounce (0.133 to 30.), and follows this with a solution of sodium hyposulphite, 1 drachm to the ounce (4. to 30.), for the production of a jet-black shade. In the way of constitutional treatment, he suggests in cases of accidental presenile blanching strict attention to the general health and arsenic internally.

ALOPECIA.¹

(Gr., ἀλωπηξ, a fox.)

(CALVITIES, DEFLUVIUM CAPILLORUM, DEFICIENCY OF HAIR, BALDNESS. *Fr.*, ALOPÉCIE; *Ger.*, KAHLHEIT.)

The simple term alopecia is no longer descriptive of a disease, but only of a symptom, loss of hair, which occurs in a large number of morbid and even physiological states. For convenience of description the alopecias may be enumerated as congenital, premature or presenile, and senile. Alopecia areata being distinctly different from the affections generally associated with alopecia simplex, is considered separately in these pages.

ALOPECIA CONGENITA.²(HYPOTRICHIASIS, ALOPECIA ADNATA, OLIGOTRICHIA CONGENITA, CONGENITAL ALOPECIA AREATA, UNIVERSAL CONGENITAL ATRICHIA. *Fr.*, ALOPÉCIE CONGÉNITALE.)

Under these several titles has been described a group of rare cases in which the symptoms, though possibly originating from different causes, are suggestively similar. The following named conditions are often designated by the name given:

1. Complete and universal absence of hair at birth, not succeeded later in life by a pilary growth. This is believed to be an intra-uterine atrichia due to failure of development of the hair pouches.

2. Universal congenital hypotrichiasis, in which hairs develop in all regions of the body, but later fail to be succeeded by filaments normal in length, vigor, color, and texture. Two subvarieties of this condition have been recognized: (a) The infant at birth is provided with the relatively long hair of most normal infants. This in due time falls and is replaced by a scanty down which later in life fails to ensure a normal hirsuteness of the scalp. (b) After birth, the infant fails to lose the temporary hair of the scalp which persists but later produces a scanty or ill-developed pilary growth.

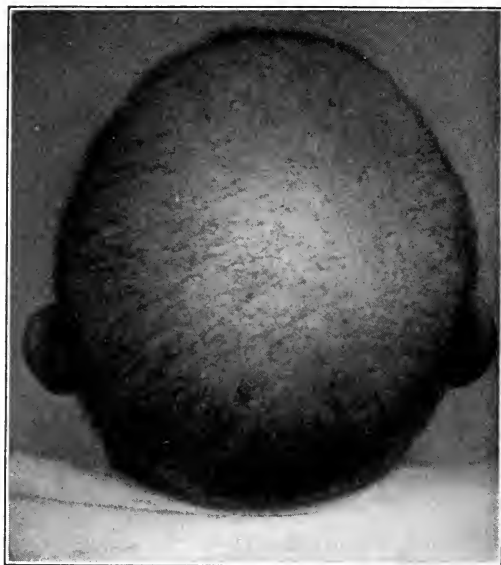
3. Complete or partial absence of hair at birth in definitely circumscribed regions, such as the scalp, the brows, the pubes, or the axillæ.

¹ Literature: MacKee, New York, N. Y. Med. Journ., 1906, July 28; Kreuzfuchs, Haarausfall und Hypertrichosis, Wien. med. Presse, 1906, No. 51; Barton, A Case of total Alopecia following the use of cantharidin, The Lancet, 1905, Oct. 21, p. 1181; Saalfeld, Zur Behandlung des vorzeitigen Haar Ausfalles, Therap. Monatsh., 1905, Nr. 4; Meyer, Toxic origin of Alopecia (Organismus und Krankheit), Deutsche Praxis, 13, Nr. 21; d'Amato, Die Präventivebehandlung der frühzeitigen Kahlheit, Bollettino delle mal. vener. sifil. urin. e. della pelle, 1905, No. 7-8; Le Fevre, Falling hair; what can we do for it? Amer. Journ. Derm. and Genit.-urin. Dis., 1905, No. 10; Eck, Beitrag zur Übertragbarkeit der Alopecie, Journ. Des Mal. Cutan. et Syphil., 1908, Heft 3-4; Echner, Alopecia, Am. Jour. Med. Sci., 1905, April.

² For bibliography see a paper by the author published in J. C. D., December, 1908.

4. Generalized or circumscribed absence of hair at birth, followed in later life by a normal hair-development. This condition is believed by writers to be due to pre-existing intra-uterine disease or

FIG. 195.



Alopecia congenita.

to such a disease seriously involving the hair-pouches at birth, resulting in a true alopecia, evidences of which may be wanting at the date of first examination by the physician. Thus some cases of congenital hair-absence are recorded as due to alopecia areata, to intra-uterine nervous shock, etc.

5. Cases in which one or all of the anomalies cited above coexist with anomalous conditions recognized in the teeth, nails, and other organs.

Dubreuilh and Petges¹ in a valuable paper on the subject of circumscribed congenital alopecia have discriminated between the following varieties:

1. Circumscribed congenital alopecia, occurring upon a portion of the body chiefly the scalp, where there has been a congenital nævus either actively developed or in the process of involution.

The nævus may simply cover the area in continuity with the patch of alopecia, though possibly separated by an interval of sound skin. Usually in these subjects, nævi are found elsewhere on the body. In these cases the outline of the patch is irregular with brownish or oval borders, the plaque being slightly elevated, even mamelonated, dark colored or pigmented, and sometimes covered with a downy growth of hair.

¹ Annales, 1908, s. iv., ix., p. 17.

2. Circumscribed congenital alopecia, resulting from arrested development of the skin. In these cases, the plaques are simply situated near the posterior fontanelle, over the occiput, or on or near the median line. There is usually no downy growth, no atrophy of the skin, and sometimes non-elevation of the surface.

3. "Obstetrical" alopecia, characterized by irregular and variable outline of the patch, the skin being thin and not provided with a downy growth over a relatively large area occupying the parietal or fronto-parietal regions, where the forceps of the obstetrician are applied.

4. "Sutural" alopecia, produced by enlargement of the cranium before union of the bones, its seat coinciding with the lines of the union of the cranial bones. There is adherence of the scalp to the cranial layers and a few normal hairs irregularly situated.

The anomalies thus described are rare, the rarest being those in which there is failure of development of the hair-pouches, congenital, complete, and permanent.

The absence of hair may be limited to one, several, or all regions of the body including the scalp, brows, axilla, and pubes, and the general surface normally provided with hair. The "complete and absolute cases" of the sort described by Eshner, Schede and Ziegler, are extreme divergencies from the average and due either to non-development of the hair-pouches or intra-uterine atrophy.

The Australian races described as hairless seem to have included merely groups of aborigines of that country some members of which only are completely destitute of hairs. It is noteworthy that in some of these cases improvement has occurred under treatment.

In cases commonly recorded under the titles given above, the members of one family or generations of a single family may be similarly affected; parents and child, grandparents and uncles, cousins and cousins-german, and other near or slightly removed relations of the subject of the anomaly may exhibit both natal and post-natal hypotrichiasis. Nicolle and Halipré report the existence of this anomaly in thirty-six individuals occurring in six generations.

The teeth and nails are frequently altered in cases of congenital alopecia. The teeth may be changed in every gradation from that in which there are few, defective, oddly arranged or shaped, or doubly ranked teeth, to the point of complete edentulism. When but three or four teeth are present, these are usually molars of the lower jaw, the incisors and canines being absent. It is probable that defects of the nails are somewhat more common than associated defects of the teeth, though accurate statistics are wanting. The number of male subjects presenting these anomalies is nearly double that of the female sex. In a record of fifty-eight cases where the sex of the subject is given, it appears that thirty-eight were males and eighteen females.

Other abnormal conditions associated with atrichia and hypo-

trichiasis are recognized in those who have abolished or defective secretions, who do not sweat, who shed no tears, who have impaired sense of smell and taste, and who are not provided with mammary glands. We have reported a case in which there was coincident webbing of the fingers and of the toes with citation of a similar case observed by Dr. Winfield, of Brooklyn. Several of the subjects of the anomalies are reported as victims of alopecia areata, atrophy of the finger tips, hereditary epidermolysis bullosa, and xeroderma. In a small group of cases, two observed by myself, whitish mosaic-like areas have been recognized in the retina supposed to be due to retinitis albicans, but more probably the result of congenital reversion, the type of some of the lower animals whose retinae exhibit areas through which the sclerotic is projected.

Etiology.—The anomaly is probably due to failure of development of the hair-pouch from the epiblast. The disorder is not contagious; no microbe has been recognized as effective in its production. The mothers of some of the subjects of the anomaly have suffered from ante-natal alopecia areata.

Pathology.—In some instances blind sebaceous glands and hair-pouches have been recognized; in others there has been failure of development of the hair-pouches. According to Schede, Atkins, and Ziegler, the sebaceous and sudoriparous glands are normal but in the derma epithelial cylinders can be recognized composed of five or six layers of cells with a central lumen but destitute of hair-papilla and the hair itself. These are supposed to represent hair-sheaths incompetent to produce evolution of the pilary filament. Brocq, representing his colleagues in France, sets down among the forms of congenital alopecia consecutive to pathological processes those conditions in which there are hair-nodes (*pili annulati*, *trichonodosis*, *monilethrix*, *aplasie moniliforme ou intermittente des cheveux*). These are conditions in which after the birth-hair is shed, the filaments produced later are sparse, short, fragile, and more or less checkered along the shaft into the nodosities and narrowings characteristic of *trichonodosis*. Most of the subjects of the disorder are affected with *keratosis pilaris*.

Treatment.—The treatment of these conditions is that which should be employed in cases of alopecia simplex.

Prognosis.—It is to be remembered that many of these cases are hopeless, the hairs never developing to a normal condition, the nails always undeveloped, and in some cases the teeth permanently deficient in number and size.

ALOPECIA PREMATURA.

Premature or presenile alopecia (*premature calvities*) is that form of acquired baldness which occurs in individuals who have not attained advanced years. Idiopathic and symptomatic forms are recognized by writers, though it is probable that a definite cause exists for cases occurring in individuals under forty-five years of age.

The IDIOPATHIC variety does not originate in the diseases of the scalp or of the general economy that are recognized as effective in the production of other forms of baldness. In many cases, however, classed as idiopathic a careful search will reveal the presence of a seborrhœa. It is, as with senile alopecia, more common in men than in women, and is in the former sex decidedly prevalent among those leading sedentary lives. The loss of hair may be produced either rapidly, or, more commonly, slowly, and at any period after the puberal epoch. It is always symmetrical and at times remediless, partial calvities being the permanent result of the process. The pilary growth may recede gradually and evenly from the forehead, or, what is more frequent, recede from the temples on either side of the median line, leaving a more vigorous crop extending centrally toward the root of the nose, or produce the effect of the tonsure described above. In many families there is a predisposition to this premature loss of hair, usually in the form of the receding temple, that may be recognized in the males of succeeding generations.

The process may begin with slight thinning of the hairs in the affected regions as the result of loss of the pilary filaments, but on close examination it becomes clear that the hairs which remain are relatively lustreless, and lacking both in vigor and in size as compared with the hairs growing on unaffected portions of the scalp. Often the fall of individual hairs is followed by a new growth of younger filaments, these rarely developing beyond the grade of short and slender hairs which either soon disappear or persist without much further development. It is noticeable that the ensuing loss (usually very gradual, occasionally rapid as a consequence of changes in the bodily health) may be associated with the growth of strong and actively growing hairs over unaffected regions (occiput, bearded face, pubes, etc.). In some persons the baldness, even before the attainment of the middle of the third decade, involves the greater part of the scalp.

The obvious causes are assigned different weight by different authors, inherited tendencies playing an important part. In-door occupations, such as are the lot of the professional classes, counting-room workers, etc., and the wearing of stiff hats which operate not merely by exclusion of sunlight and air, but also by constriction of the scalp about the temples, are largely responsible for the result. The claim that daily application of water to the scalp is a cause of baldness is ill-founded. Many individuals who have indulged regularly in the practice for years have exhibited a luxuriant growth of hair on the scalp even in old age; and the animals not aquatic, whose education or instincts have led to very frequent immersion of the skin in water are not known to suffer from induced alopecia, though it is well known some of the domesticated animals suffer largely from alopecia due to other causes (errors in diet, artificial habits as respects housing, etc.).

SYMPTOMATIC PRESENILE ALOPECIA may result from a number of systemic and local conditions. Loss of hair (*Defluvium Capillorum*) is common after typhoid, eruptive, and other fevers, and after other local and systemic disorders interfering with the nutrition of the scalp. Frequently the hairs do not fall for some weeks after the patient has recovered from the constitutional disturbance, but remain in their follicles until pushed out by the new hairs, or until gradually pulled out by the use of brush and comb. In these cases there is usually a general and symmetrical thinning of the hair. The loss is not often permanent, as new hair gradually replaces that which has fallen. The alopecia of the early periods of syphilis is of this order, but occurs in characteristic patches. A slower loss of hair is seen in many cachectic conditions such as tuberculosis, diabetes, leprosy (in which the alopecia is limited often to the eyebrows and eyelids), and myxœdema.

ALOPECIA FURFURACEA.

Of all the local causes of alopecia, seborrhœa (*q. v.*) in some form is the most frequent,¹ the condition produced being variously designated as *Alopecia Furfuracea*, *Pityriasis Capitis*, *Alopecia Pityrodes Capillitii*. Loss of hair varying from moderate thinning of the growth to considerable symmetrical baldness, usually of the vertex, accompanies the pityriasic forms of seborrhœa or eczema seborrhœicum of the scalp. The affection is exceedingly common, especially in men.

The disorder, essentially chronic in course, may be gradual or relatively rapid of occurrence. Usually it is manifested first in early adult life, though persons of both sexes, from twelve to fifteen years of age, may at these ages display typical forms of the disease. After the condition known as DANDRUFF has existed for some months or years the subject of the affection discovers a relatively large loss of hair from the scalp, producing thinness of the growth upon the vertex, near the brow, or over the temples. The hairs, when examined *in situ* upon the scalp, are shortened, dry, harsh, lustreless, and rarely well anointed with sebum. They are rebellious to comb and brush, and project irregularly from the brushed surface. Those shed from the scalp, especially of men, are found to be nearer in type to the lanugo- or downy hairs than those which fall physiologically from a vigorous growth of hair in a healthy subject; that is, they are short, thin, pointed, and often with an indistinct medulla.

At the same time the scalp is in process of incessant desquamation, the scales usually being of pityriasic type, and exceedingly abundant so long as the alopecia is not complete, after which the epidermal catarrh soon disappears. The mealy, bran-like scales are shed in a fine shower upon the clothing of the patient, and, the disease being

¹ Of 300 cases of premature alopecia, Jackson (J. C. D., 1900, xviii., p. 352) found 75 per cent. due to seborrhœa. Elliot (N. Y. Med. Jour., 1895, lxii., p. 525) states that of 346 cases over 90 per cent. were due to this cause.

more common in men than in women, its traces are often distinct upon the collar of the coat after the fingers have been passed through the hair. The same flour-like, whitish and grayish scales are distinct and plentiful among the hairs to which they cling, and they can also be recognized over the scalp-surface when the latter is inspected with care. Itching is often marked; the scalp may be scratched and torn by the nails, and is, in some cases, reddened and thickened. The condition is prone, sooner or later, to develop the severer phases of seborrhœa and dermatitis seborrhœica.

Other local causes of alopecia are found in various inflammatory disorders of the scalp, such as psoriasis, eczema, etc.; in morphœa, lichen atrophicus, and lupus erythematosus; in syphilitic, tubercular, and other destructive lesions; in some forms of folliculitis (considered in the succeeding pages) in which the follicle and surrounding tissue are destroyed by suppuration; in ringworm, favus, and other parasitic affections of the scalp; in traumatism, which may occur as a bruise or be the result of scratching or rubbing; after drug ingestion (thallium acetate); and after exposure to the x-rays.

The forms of alopecia described above as encountered upon the scalp may involve also other hairy portions of the body, as of the axillæ and the pubes; and these also in variable degrees.

ALOPECIA SENILIS.

The senile condition is by no means a synonym for baldness. Many men of advanced years are vigorous, and have no loss of hair on the scalp, an abundant pilary growth, grayish and at times silvery-white, covering the cranial surface. The baldness occurring in old age, whether upon the vertex so as to produce a tonsure like that of the priest, or whether limited to the frontal region, or so extensive as to involve nearly the entire calvarium leaving a fringe of hairs at the occiput and temples merely, is always remarkable for its symmetry. There is, hence, a certain degree of dignity added to the appearance of the head that an asymmetrical loss of hair does not produce. It may occur at varying ages of advanced life, and is frequently traceable to an early seborrhœa sicca. It is much commoner in men than in women, largely because of the difference in the manner of covering the head in the two sexes, women usually wearing an exceedingly light dress for the head, while men encase the latter with tight-fitting caps or hats which interfere with proper aëration of the scalp. Individuals of the male sex, also, in consequence of wearing the hair short, bestow far less time upon the care and dressing of it. In uncivilized races these differences are less marked, men pay great attention to the ornamentation of the scalp, and senile baldness is of less frequent occurrence.

The bald surface, as a rule, is smooth and shining, the atrophy of the pilary system corresponding to that noticeable in other structures of the aged; it is occasionally the seat of a seborrhœa oleosa. The

hair-follicle, with its accessory sebaceous glands and occasionally the skin itself, are often in a state of atrophy, though there may be dilatation of the sebaceous glands. There is commonly blanching of the hairs, which are shed gradually, as also of those which remain, though the canities is not constant. This condition is much less frequent upon the surface covered by the beard and pubic and axillary hairs, where according to Michelson, the hairs in advanced years are often denser than at other periods of life.

Etiology and Pathology of the Alopecias in General.¹—The causes of congenital alopecia are not known. In some cases it is an expression of reversion to type. Senile alopecia is attributed by many to the general atrophic changes which take place in the aged. This atrophy evidently will not explain the cases, often classed as senile alopecia, occurring in men under sixty or seventy who are in all other respects vigorous. The hair-loss in systemic conditions is due largely to defective innervation and nutrition of the scalp. Those due to trauma, to the presence of vegetable parasites, and to destructive agents of any sort, are explained readily.

There remain numerous cases of idiopathic alopecia the causes of which are obscure or differently interpreted by different observers. Those associated with seborrhœal flux are explained by Unna on the basis of the morococcus recognized by him; while Sabouraud assigns as the chief factor for many forms the seborrhœal micro-bacillus discovered by him, pointed at both ends, minute, colorless, increasing by division in twos, forming thus chains, congregating in enormous numbers in the hair-follicle below the epiderm, and where the sebaceous gland joins it. By injection of a pure culture, a rabbit was made bald in 40 days.

According to the same author, the bacillus responsible for the result produces first an irritative effect in the horny layer of the skin with the result of forming a "cocoon" agglutinated to one side of the pilary shaft. Then follow: sebaceous flux, hypertrophy of the sebaceous gland, atrophy of the hair-papilla; and gradually thereafter pigment-failure, absence of medullary cells, thinning of the filament, its substitution by a dwarfed hair, and eventually calvities.

Round and oval spores have also been described by Mélassez (1874) as existing both in the hair-pouches and in the neighboring horny layers of the scalp.

¹Literature: Bettmann, *Über experimentelle Alopecie*, *Verhandlungen des V. internat. dermatolog. Kongresses*, Bd. ii. Buschke, A., *Experimenteller Beitrag zur Kenntnis der Alopecie*, *Berl. klin. Wochenschr.*, No. 53, 1900. Idem, *Über experimentelle Erzeugung von Alopecie durch Thallium*, *Verhandlg. der Deutschen dermat., Gesellschaft*, 1901. Idem, *Weitere experimentelle Untersuchungen über Alopecie und die Lokalisation von Hautkrankheiten*, *Berl. klin. Woch.*, No. 39, 1903. Sabouraud, *Traitement des teignes tondantes*, *La Prat. dermat.*, t. iv. Combemale, *Echo médical du Nord*, 27 Febr., 1898. Jeanselme, *Soc. de Derm.*, Nov. 10, 1898. Guinard, *Journ. des Practic.*, Nov. 26, 1898. Hallopeau et Laffitte, *Soc. de dermatologie*, 1899. Giovannini, *Dermat. Zeitschr.*, Dec., 1899. Vassaux, *Thèse de Paris*, 1898, *L'acetate de thallium en thérapeutique*. Vignolo Lutati, *Giorn. ital.*, 1905; Nobl, *Archiv*, 1906, lxxviii., 113.

The views of none of the observers and experimenters who have devoted an enormous amount of skill and energy to this work have achieved general acceptance. One of the chief objections to such acceptance rests upon the fact that the complete clinical picture of seborrhoic and other forms of alopecia has never been reproduced artificially either upon man or animals.

Alopecia has been explained by a number of writers as due to toxins elaborated in the system. Parker, for example, has separated from expired air a "trichotoxicon," believed to originate in the residual air left in the upper portion of the lungs in men living a sedentary life. With the product obtained this author seems to have induced alopecia in pigeons. Meyer believes that the intestinal tract furnishes a similar toxic agent.

Experiments have been conducted by Carlo, Buschke, Nobi, and others showing that the acetate of thallium produces in the lower animals systemic effects, even in cases lethal, with partial and in some cases total baldness. The applications were made externally in the strength of one to six in vaseline or traumaticine; the salt was also injected subcutaneously. By reducing the strength of the salt in man, thallium alopecia has been advocated as an effective measure, not as yet wholly without danger, in removing hair from the skin in some of the disorders due to the vegetable parasites. The application of cantharidin has produced a similar extensive baldness (Baston).

Treatment.—In alopecia the underlying conditions, local or systemic, must be treated by measures appropriate to each case. Elliott, Jackson, Kreuzfuchs, and others call attention to the great importance of prophylaxis. Early and persistent scalp massage, permitting the hair to grow at some length as in the case of women who preserve the hair as a rule better than men, and wearing of loosely fitting head-coverings are of value. The Christ Church Hospital boys of London, who never wear hats, are remarkable for the thickness and vigor of the hair of the head. The naked negroes of Africa, men and women alike, who use their hair for protection from the tropical sun, have superb (however filthy) coils of hair covering the head. If the head of man were never artificially covered, it is probable that there would be no baldness save that produced by a distinct disease of the scalp. The use of brushes and combs in common by members of one family is to be forbidden. The same rule applies to these utensils in hotels, parlor-cars, public resorts of all kinds, and hair-dressing establishments. Respecting the covering of the scalp with hats, writers have called attention, first, to the consequent exclusion of light and air; second, to pressure upon the circle above the ears and about the temples whereby the vascular supply of the vertex is impeded (it is here and over the temples where the thinning of the hair commonly becomes first apparent); third, to the consequent hypersecretion of sweat (Meyer).

In the management of alopecia the general health should always

be considered, and any condition interfering with the nutrition of the scalp and hair should be removed. Cod-liver oil, the ferruginous tonics, and the hypophosphites, are indicated in many cases. The distaste for fats shown by certain victims of alopecia furnishes an indication in their systematic management.

The following general considerations are worthy of attention in many cases: Massage of the scalp, practiced by the fingers once or twice daily in such a manner as to influence the subdermal structures, is useful. A pillow filled with hair or other equally firm material, should be preferred to the feather pillows in common use, and in which the scalp is often too warmly and too deeply cushioned. In the case of women the wearing of artificial hair should be interdicted; as well as the use of the "crimping-iron" and the curl-paper. Sharp hat- and hair-pins thrust deeply between the hairs are often a source of serious damage. In all patients the access of sunlight and fresh air is needful for the vigor of the hairs of the scalp. Disuse of the brush and preference for the comb in arranging the hairs on the head of women are responsible for the hair-loss in many instances. Every scalp from which the hairs are falling requires daily, gentle, systematic friction with a hair-brush the bristles of which penetrate to the scalp-surface and stimulate gently without wounding or irritating. Faradization and electricity being as a rule less systematically available, may be regarded as useful adjuvants in the hands of the expert. Singeing the hairs is without question harmful. The hat should be light, and well ventilated, and worn as little as possible.

Local treatment is of importance in nearly all cases, and in general is directed toward stimulating the nutrition of the hair-follicle by producing in its periphery a species of transitory and artificial hyperæmia. This result is accomplished by the local employment of one or more of the alcoholic, oily, alkaline, and other stimulating applications described below.

Local treatment may often be preceded by shampooing with either the Sarg fluid soap or combinations of glycerin, alcohol, and *sapo viridis* (tincture of green soap); or with eggs to meet the requirements of individual cases. The shampooing may be practised every few days, once in the week, or once every two or three weeks, according to the needs of each case. The scalp after all such shampooings should be anointed with lanolin, plain or salicylated; vaselin; equal parts of lanolin, glycerin, and rose-water; the oil of benne; or scented castor-oil. In obstinate cases the nail-brush may be used vigorously over insensitive scalps at the time of shampooing. The ointment-bases named above may often be medicated advantageously with sulphur, resorcin, chrysarobin, tar, cantharides, or mercury. Instead of ointments, lotions containing cantharides, carbolic acid, capsicum, resorcin, mercuric chloride, ammonia, or *nux vomica* may be used. Care should be taken to avoid unpleasant staining or dyeing of the hair by both resorcin and chrysarobin.

The former should never be compounded with ammonia. Formulæ for lotions and salves to be used in this way are appended:

℞ Hydrarg. chlorid. corros.,	gr. v;	33	
Spts. vin. rectif.,	ʒij;	60	
Acid. acet. dil.,	ʒij;	8	
Glycerin.,	ʒss;	15	
Aq. ros.,	ʒvj;	180	M.
℞ Hydrarg. bichlorid.,	gr. iiij;	20	
Tinct. cantharid.,	ʒss;	15	
Ol. amygdal. dule.,	ʒj;	4	
Spts. rosmarin.,	ʒj;	30	
Spts. vin. rect.,	ʒij;	60	
Aq. destill.,	q. s. ad ʒvj;	q. s. ad 180	M.
℞ Sulphur. præcipit.,	ʒj;	4	
Lanolin.,	āā ʒijss;	āā 10	M.
Glycerin.,			
Aq. rosæ,			
℞ Hydrarg. chlorid. mit.,	ʒiv;	5	33
Hydrarg. ammon.,	ʒij;	2	66
Vaselin.,	ad ʒj;	ad 30	M.
			[Bronson.]
℞ Resorcin.,	ʒj;	4	
Quinini (alkaloid),	gr. xv;	1	
Ol. ricini,	℥ x-xxx;	0	66-2
Alcohol.,	ad ʒiv;	ad 128	M.
			[Stelwagon.]
℞ Cantharid. tinct.,	ʒij;	8	
Capsiei tinct.,	℥ xv;	1	
Spts. vin. rect.,	ʒjss;	45	
Aq. ros.,	ad ʒv;	ad 150	M.

Where the hair is unusually dry, Saalfeld employs:

℞ Tannobromini,	gr. xv;	1	
Bals. Peruv.,	ʒss;	2	
Adipis colli equini,	ad ʒi;	30	

Richema and Staganovitch advise:

℞ Acid. lactic.,	ʒii-iv;	8-16	
Spirits. vin. rect.,	ʒj;	30	
Aq. ros.,	ʒj;	30	M.

To be applied with absorbent cotton, using friction until the surface is reddened.

Roussel advocates the hyposulphite of sodium in 25 per cent. solution.

Walsh advocates: Lysol, one part; alcohol, eight parts; and rose-water, 25 parts, adding cantharides if desired. He also recommends a lotion composed of:

Acid. salicylic.,	ʒij;	12	
Acid. carbolic.,	ʒj;	4	
Olei ricini,	ʒij;	12	
Spts. vin. rectif.,	q. s. ad ʒvi;	180	M.

The addition of acetic acid to a scalp-lotion seems to favor penetration of other remedies. Pilocarpine hypodermatically has given good results. Further suggestions regarding the details of treatment of alopecia, and the special remedies recommended for alopecia furfuracea, are given under Seborrhœa.

Prognosis.—Congenital, senile, and many of the so-called pre-senile idiopathic alopecias are practically remediless, though in all forms further loss of hair often can be prevented or greatly retarded by proper treatment. The symptomatic alopecias in which there is destruction of the hair-follicle, as in lupus erythematosus, syphilitic ulcers, favus, and some forms of folliculitis, are permanent; those due to systemic disorders and to local inflammations are usually temporary. In alopecia due to seborrhœa persistent treatment will prevent further loss of hair, and in recent cases may produce a new growth.

ALOPECIA AREATA.¹

(Lat., *area*, a vacant space [*arere*, to whiten, Fox].)

(PORRIGO DECALVANS, TINEA DECALVANS, AREA CELSI, AREA JOHNSTONI, ALOPECIA CIRCUMSCRIPTA. *Fr.*, PELADE.)

Symptoms.—Alopecia areata is a disorder affecting the hairy surfaces of the body, often limited to the scalp but at times generalized, characterized at the outset by the occurrence of one or several, circum-

FIG. 196.



Alopecia areata.

scribed, round or oval areas completely destitute of hair and exhibiting few if any other changes in the part affected. Crocker makes an etiological classification of these cases, assigning to a first class the

¹ For bibliography, see Déhu, *La Pratique Dermatologique*, t. iii., p. 647.

“universal” forms; to a second the local or neurotic forms; to a third the parasitic forms, “true alopecia areata”; and to a fourth the circinate seborrhoic forms.

The hair-loss is limited usually to the scalp, but may occur upon the beard, the genitalia, axillæ, brows, eyelids, and the general surface of the body. Cases occur, especially in early childhood, in which the closest scrutiny with a glass fails to detect a single filament of hair upon any portion of the skin.

The disease commonly manifests itself by the sudden and complete loss of hair over a circinate, circumscribed patch, usually upon one side of the scalp, so rapidly effected that a first discovery of the

FIG. 197.



Alopecia areata.

fact may be made at the toilet of the morning. Occasionally vague neurotic sensations precede the hair-loss. In yet other cases the loss of hair is gradual, the patch attaining large dimensions in the course of two or three weeks. Less frequently an area of baldness will continue to extend peripherally for many weeks. Instead of one area, there commonly are several, which may develop simultaneously or at varying intervals.

The patches may be round, oval, circinate, or irregularly shaped, and may vary in size from that of a small coin upward. They may be so numerous as to disfigure the entire scalp, and though they touch at the borders they can scarcely be said to coalesce, as the individual areas are usually recognizable. Extension, however, may occur by coalescence of patches as well as by development of the area of a single patch. Their surface is smooth, soft, whitish, and usually destitute of hairs. The affected scalp may be thinner and more lax

than normal, and often is depressed slightly below the level of the surrounding skin, but in rare instances it is tumid and slightly red-dened. As a rule, there are no subjective sensations, though the affected areas may be the seat of slight pruritus, or of anæsthesia, and are nearly always less sensitive to irritating applications than the surrounding normal parts.

The hairs at the periphery of patches that have attained their full development are normal in every way, and are firmly implanted in their follicles, but at the borders of areas which are still spreading the hairs are loose and fragile, often broken off near the surface, thus leaving short stumps which exhibit at the bulb a spade-like extremity

FIG. 198.



Alopecia areata.

FIG. 199.



Alopecia areata.

or an attenuated point, the non-atrophied shaft thus contrasting with the wasted portion implanted below the cutaneous level. Crocker likens their shape to that of the exclamation-point. Newly formed areas may be covered in greater or less degree with these characteristic hairs, which, however, soon fall out.

The course of the disease is variable; it may persist for months or years without apparent change; or new patches may form while those of an older date gradually regain wholly or in part the pilary growth which, however, may be lost repeatedly in the same area. Shifting areas of baldness may in this manner invade the entire surface of the scalp, which yet at any one moment of time exhibits a loss of but part of its hirsute covering.

When the filaments begin to reappear there is commonly a fine downy growth over the affected area, later replaced by a crop of thicker and stronger whitish filaments, which are always succeeded, in cases terminating favorably, by a growth of hairs as well colored, as vigorous, and as persistent as any which were at first lost. An odd appearance is often presented by patients who are improving, when

the young and white new hairs contrast vividly with the dark shade of those on the unaffected scalp.

This disorder, which is more common than is generally believed by physicians, may, in some cases, at its outset be preceded or be accompanied by symptoms of ill health, such as headache, malaise, inappetence, loss of flesh, or malnutrition. In other cases, cephalalgia, paræsthesia, pruritus, and formication of the skin of the scalp and other regions indicate disturbance of the nervous centres. Often, however, patients of this class are in sound health.

Among the unusual features of the disease may be mentioned the occurrence of alopecia in bands or streaks; at the site of an injury or along the course of a nerve; or over the entire body, removing even the finest lanugo-hairs. Universal alopecia may occur suddenly, or as the result of a gradual thinning of the hair, or may follow the existence of the disease in characteristic areas. This variety of alopecia, which is fortunately rare, usually occurs after the middle period of life, but it may develop in the very young.

Odd-looking effects are produced when in the course of the disease with and without the development of patches in the scalp, the half of a moustache on one side of the face falls, or the hairs of one eyebrow or one eyelid; or even when all the hairs are lost from both brows and lids of each side of the face.

In some instances alopecia areata is associated with other cutaneous diseases. It is not rare to discover patches which are also the seat of the vegetable parasites. A male patient, long psoriatic, under our observation exhibited a typical seborrhœa capitis, and later developed a no less typical alopecia areata. Cases associated with vitiligo are reported by Besnier, Duhring, Freeland, DuCastel, and others. Coincident dystrophy of the nails has been observed by Darier and Le Sourd,¹ Crocker, G. H. Fox,² and others. Other conditions reported as associated with alopecia areata are scleroderma, thyroid disease, and moniliform hair (Walsh),³ syphilitic affections,⁴ of the same part, dermatitis, and folliculitis.

The course of the disease in young subjects is usually toward a favorable result. There is hope, as a rule, when even the downiest and thinnest growth, requiring a good light and a glass for its recognition, can be appreciated. Even when so feebly attached that these filaments are removed with ease by the fingers or a brush, and when they spontaneously fall they may be replaced by crop succeeding crop of stronger filaments, which eventually persist. In serious cases, usually after the forty-fifth year of life, and in those of long standing, there may result atrophy of the hair-follicles and a resulting remediless baldness.

There is reason for believing that the disease has a stadium of

¹ *Annales*, 1898, s. iii., ix., p. 1009.

² *J. C. D.*, 1902, xx., p. 574.

³ *Brit. Med. Jour.*, 1902, i., pp. 812, 883.

⁴ See Morrow's Case, *J. C. D.*, 1902, xx., p. 275.

evolution and involution, though its exact limits are not known. Few individuals fully recover the hair in less than one year. The majority attain the desired end within a period of two years. These limitations, however, apply to the asymmetrical forms of the disease in the relatively young. The symmetrical alopecia areata of the middle-aged is a far more formidable affection, though in some of these cases, when the loss is recent, proper treatment will restore the hair.

Few diseases are the source of greater mental distress than those of the class under consideration. The fear that they will be suspected of having syphilis and the social ostracism which the deformity entails produces a morbid mental state which is especially noticeable in nervous women.

Mewborn¹ has introduced the term *Trichopathophobia* to designate the fear of disease of the hair.

A rare form, **Alopecia Circumscripta, seu Orbicularis**, is described by Neumann in which the areas are much depressed, are the size of a pea or smaller, and are decidedly anæsthetic. The prognosis is unfavorable.

Etiology.—In their modern acceptation, the words alopecia areata describe merely a loss of hair occurring at first in restricted areas which may become generalized and which without question may spring from various causes. The conflicting views of the nature of the disease have been concerned with the etiological factors supposed to be responsible for the results, and have demonstrated the fact of their multiplicity. It is unwise to-day to describe one form as “true” and another as spurious, simply on the ground of diversity of causes. Equally unfounded is an arrangement of the several clinical appearances into different forms of the disease because of a difference in their etiological relations.

Alopecia areata occurs with equal proportion in the two sexes, rather more often in persons having dark than in those of light hair, and among these irrespective of social condition. Of the partial and asymmetrical forms, the larger number occur in young subjects, from childhood to early adult life. The severe and generalized forms are encountered more often in middle-aged persons. In the latter class especially the disease is observed occasionally to follow the obscure disorders of the nervous centres due to sudden or prolonged undue excitation. In young subjects a peculiar repugnance to the ingestion of fat and meat may often be discovered.

The neuropathic origin of a large number of cases (*Alopecia Neurotica*) is indisputable and verified in every clinical experience. Blows on the head, not rarely resulting in well-marked scars visible on careful inspection of the affected regions, nervous shock (fright, lightning-stroke, great and prolonged anxiety, grief), traumatism of other regions than the scalp-surface, prolonged and severe toil in close apartments, these again and again have produced typical clin-

¹ Jour. Am. Med. Ass., vol. 50, p. 19.

ical symptoms of the disease. Max Joseph¹ produced baldness in the ears of cats and rabbits by excision of the second cervical ganglion. Jacquet² finds that alopecia areata is associated frequently with defective teeth or other sources of irritation of the cutaneous nerves. The coexistence of well-marked alopecia areata with changes in the nails, with the symptoms of Graves' disease, and in particular in young women with cessation of the menstrual flux which is restored when the bald areas became covered with hair, all point to the nervous origin of many cases. Crocker states that 90 per cent. of all cases with complete denudation of an affected area are due to parasitic disease, but this ratio certainly does not hold good for even the average of patients seen in America.

The coexistence of alopecia areata and other affections of the invaded surface is noteworthy and suggests the possibility of etiological relations.

The parasite described by Sabouraud and those recognized by other observers have been claimed to be the effective cause of the disease, and this view is supported for a special class of cases by the evidence furnished where several instances of the disease have occurred in one family and in particular by the prevalence of so-called "epidemics" of the disease in public institutions, such as have been reported in this country by Bowen³ and Putnam,⁴ and also in France, Germany, and elsewhere. It is to be noted, however, that few of the cases reported as occurring in epidemic form have been illustrations of the disease in typical manifestations. In yet other instances in which there are good clinical evidences of contagion, it is impossible to deny that a strong case is made out in favor of the parasitic origin of the malady and the possibility of its extension by transmission of a germ from one individual to another. No classical reproduction, however, of alopecia areata has yet resulted from infection of the sound skin with pure cultures of any of the parasites claimed as effective.

Pathology.—The anatomical lesions in alopecia areata have not been determined definitely. The hairs fallen from the surface, when examined with the microscope, are seen to be atrophied in bulb and shaft, as in other forms of alopecia. Fracture of the shaft is in some cases also noted, evidently an accident of the process.

As a result of careful examination of many pathological sections, Giovannini⁵ and Robinson⁶ believe the disease is primarily an inflammation of circumscribed areas of the corium, and especially of the subpapillary layer. In a small patch of one week's duration Robinson found marked perivascular cell-infiltration in a limited region of

¹ Monatshefte, 1886, v., p. 483.

² Annales, 1902, s. iv., iii., p. 97; see also Trémolières, Presse méd., 1902, liv., p. 576.

³ J. C. D., 1899, xvii., p. 400.

⁴ Arch. of Pediat., 1892, ix., p. 595.

⁵ Annales, 1891, s. iii., ii., p. 921.

⁶ Morrow's System, vol. iii., p. 865.

the corium, the papillæ being but mildly affected, while the epithelium, rete, subcutaneous tissue, and glands were normal. Some of the hair-follicles were normal, while in others no papillæ could be found, and the hairs were wanting or imperfect. In cases of longer standing evidences of inflammation were more marked and extensive, and there were vessels with thickened walls and narrowed lumina. In some cases there was more or less atrophy of all elements of the corium, with destruction of the hair-follicles and sebaceous glands. Giovannini, who describes an invasion by leucocytes of the hair-follicle, considers the process a deep-seated folliculitis.

Eichhorst,¹ Thin,² v. Schlen,³ Robinson,⁴ Bowen and others discovered in affected patches and about the bulbs of hairs in alopecia areata microorganisms which were cultivated in generations, but which were not shown to be effective in the production of the disease *de novo*. In a series of three hundred cases Sabouraud⁵ found in the early stages of the disease a micro-bacillus. He obtained pure cultures, with which he produced typical areas in calves, rabbits, and guinea-pigs. He finds the same bacillus in comedo, acne, and seborrhœa, and believes that alopecia areata is an acute form of seborrhœa oleosa.

He finds constantly in the early stages large numbers of his micro-bacillus surrounded by keratinized epithelium, forming a cocoon-shaped mass which occupied the much dilated follicle-neck. In the later stages of the disease he finds no bacilli, but describes inflammatory changes, atrophy of the follicle, and achromia of the basal layer, all of which he ascribes to the influence of local toxins. Walker and Rockwell⁶ found that in the majority of 63 cases examined by them, the hairs were sheathed with staphylococcus epidermidis albus (Welch) and there was coexistent seborrhœa.

Diagnosis.—Alopecia areata is to be distinguished from vitiligo of the hairy portions of the surface by the preservation of the pilary growth in the disease last named, the filaments, moreover, having usually a blanched and whitened look, due to the absence of pigment.

From ringworm and favus of the scalp the disease in question is differentiated by the suddenness of its onset; the absence of stumps of hairs, scales, crusts, and evidences of irritation in the involved area; the whiteness, smoothness, and complete baldness of the latter; and, above all, by the failure to detect with the microscope the evidence of the presence of a vegetable parasite. Ringworm and alopecia areata may coexist. In cases of so-called "bald-ringworm" the diagnosis must rest upon the microscopical findings.

The asymmetrical patches of seborrhœa of the scalp are recognized by the presence of the fatty plates pasting the hairs to the scalp-surface, as well as by the slow and very gradual onset of the disorder.

¹ Virchow's Archiv, 1899, lxxviii., p. 197.

² Trans. Royal Soc., 1881-82, xxxiii., p. 247.

³ Virchow's Archiv, 1885, xciv., p. 327.

⁴ Morrow's System, vol. iii., p. 862.

⁵ Annales, 1896, s. iii., vii., p. 253.

⁶ Scottish Med. and Surg. Jour., 1901, viii., p. 12.

Other forms of baldness than those named above are all of gradual and, in their early stages, of symmetrical development. Those resulting from traumatic injuries of the scalp with cicatricial results are easily determined as having such an origin.

Treatment.—One necessarily views with distrust all treatment for that disease which in the course of months or years usually terminates in spontaneous recovery, and in the meantime may bid defiance to each and every therapeutic measure. Nevertheless, persistent and hopeful management of even apparently desperate cases is occasionally rewarded by such brilliant consequences that, however slight may be the foundation for a belief in the value of the therapy employed, it deserves recognition and trial.

The hygienic management of every case is a matter of importance. The general condition of the nervous system should be considered and may call for changes in the habits of working, eating, resting, and exercising. Tobacco in every form should be denied to subjects of the disease. Iron, quinine, nux vomica, cod-liver oil, phosphorus and the hypophosphites, arsenic, and strychnine are often indicated, and used with great benefit. Crocker advocates the administration of the nitrate of pilocarpine $\frac{1}{8}$ to $\frac{1}{4}$ grain (0.008–0.01) at night, a flannel night-dress being worn subsequently. Pilocarpine by hypodermatic injections into the scalp in doses of from $\frac{1}{30}$ to $\frac{1}{10}$ grain (0.0015–0.006) is also praised.

There are few patients who are not benefited by daily salt-and-water bathing of the entire body-surface, followed by brisk friction, especially over the spinal region. In the case of children this treatment must be conducted by a skilled hand. When practicable the cold douche is to be preferred.

In all cases in which the scalp is involved in either sex, and in which the special hypochondriasis of the disease is developed, a wig should be worn for the sake of its moral effect upon the sufferer. Its use, however, should be limited to social occasions, visits, etc., as the persistent wearing of a peruke indoors seems to lengthen the course of the disease.

The indications for local treatment are, by the precautionary measures, useful in restricting the spread of ringworm and favus of the scalp to prevent possible transmission of the disease to unaffected persons, to destroy any parasites that may be present, and to increase the physiological afflux of blood to the hair-follicles. With this end in view the affected parts are to be bathed daily in water as hot as can be tolerated, then dried, and rubbed with a stimulating lotion. After the lotion dries it is well to apply an oil or simple ointment. The articles usually employed are alcohol, ether, resorcin, formalin, turpentine, ammonia, camphor, cantharides, carbolic acid, oil of mace, croton-oil, tincture of nux vomica, tincture of capsicum, tincture of aconite, castor-oil, tar, iodine, sulphur, and the mercurials. All frequently fail. Several of these substances in combination seem at times to be of service.

The following is a formula, the ingredients of which may be varied to suit the indications in different cases.

R	Ol. ricini,	f̄ss;	15	
	Acid. carbolie.,	3j;	4	
	Cantharid. tinct.,	5ss;	15	
	Ol. rosmarin.,	gtt. xv;	1	
	Spts. vin. rectific.,	ad f̄3iv;	ad 120	M.
Sig. For external use over the scalp with friction.				

The preparations containing sulphur, resorcin, pyrogallol, and chrysophanic acid (which have the disadvantage of staining the hair), mercuric chloride, etc., given on a preceding page in connection with the treatment of *Seborrhœa Capitis*, are often valuable.

Formalin in solutions of 0.5 to 2 per cent. is sometimes efficient. It should be used with care, however, as it has occasioned severe dermatitis, and in several instances has given light hair a green color.

Jackson recommends liquor ammoniæ fortior, applied once or twice daily to the bald areas. Speedy return of hair in a patch of alopecia areata has followed the application of pure creosote and also of trikresol to the denuded surface, resulting in moderate vesication. The spirit of turpentine and pure carbolie and acetic acids have similarly been employed; but caustic applications are to be used with caution, and over limited areas at a sitting.

By many experts, having in mind the probability of a parasitic origin, epilation is practised to the extent of removing all the loosened hairs and a narrow zone of sound hairs about each patch. By others, shaving of the patches is substituted for epilation. The remedies selected for application are of the order of parasitocides; for example, mercurials, sulphur and its compounds, chrysarobin, pyrogallol, and iodine.

Repeated blisterings of the scalp with cantharidal collodion, croton-oil, spirit of green soap, and petroleum have also been employed with success. The ointment of chrysarobin has the disadvantage of staining not only the remaining hairs, but often also the face in consequence of the frequency of a transmission to that locality through the medium of the hands. When patients, however, consent to the use of chrysarobin it is worthy of trial, as its application has been followed by a vigorous growth of new pilary filaments. Hodara¹ states that the application of a 30 per cent. preparation of chrysarobin for from two to eight weeks is followed by vascular and inflammatory changes which lead, through proliferation of prickle-cells and connective-tissue cells, to the formation of new follicles, new sebaceous glands, new papillæ, and new hairs. André employed ten hypodermatic injections of pilocarpine muriate in $\frac{1}{8}$ grain (0.008) doses, which resulted, in the case of a middle-aged woman affected with total symmetrical baldness, in an abundant growth of hair. Mercuric chloride has similarly been employed.

¹ Jour. Mal. cutan., 1903, xv., p. 644.

Phototherapy has been used by Finsen, Forchhammer, Jersild, Leredde, Török, Schmidt, and others, including ourselves, in alopecia areata with, on the whole, very favorable results.¹ For circumscribed areas the light-treatment gives better results apparently than are obtained by other methods, though it fails in some instances. It has been used successfully where a number of large areas were present, but in such cases the treatment is tedious, and, as a rule, does not give such good results.

Faradization of the scalp with a stiff wire-brush, pushed to the point of producing moderate hyperæmia, has been followed by excellent results. Holz knecht² has employed the x-rays in one case with a favorable result.

Wilson recommends:

Rx	Ol. amygd. dule.,	f5j;	4	
	Capsici tinct.,	f5ij;	8	
	Liq. ammon. fort.,	f5j;	30	
	Spts. rosmarin.,	f5v;	150	
	Ol. limon.,	f5j;	4	M.

Another stimulating application is:

Rx	Ol. terebinth., }	āā f5ss;	āā 15	
	Ol. ricini. }			
	Origan tinct.,	f5j;	4	
	Ol. camphorat.,	f5j;	30	
	Liniment. volatil.,	ad f5ij;	ad 90	M.
Sig.	For external use with a brush until the scalp is irritated.			

Shaving should regularly be practiced when in men the region of the beard is involved, as the deformity is thus rendered less conspicuous; and the bald surface should be stimulated frequently with one or several of the topical applications named above. Alcoholic solutions of resorcin (3 to 20 per cent.) or of mercuric chloride, $\frac{1}{2}$ to 1 grain (0.033–0.066) to the ounce (30.), are to be well rubbed over the patch or patches once or twice daily.

Prognosis.—From what precedes, it will be inferred that, as regards the relief of the baldness, the asymmetrical development of alopecia areata in youth is much more favorable than the symmetrical general disease of middle life, the latter being often remediless. In all cases the practitioner should actively persevere to the end. In no case should any encouragement be given as to complete relief within the year, though exceptionally short careers of the disease are observed at times. The prognosis of the same affection of the beard is quite favorable, the disease, in young men, usually concluding its stadium in the course of about one year, with a favorable termination.

¹ For bibliography, see paper by Frank Hugh Montgomery, J. C. D., 1903, xxi., p. 529.

² Wien. klin. Rundschau, 1901 (abstr. in B. J. D., 1902, xiv., p. 35).

SYCOSIS.

(Gr., σῦκον, a fig.)

The title "sycosis" no longer indicates an idiopathic affection. It is employed in these pages to designate a group of different disorders, which, affecting for the most part the region of the male beard, may be for practical purposes classified as follows:

Coccogenous Sycosis includes the most numerous of the cases to which the term "sycosis non-parasitica" was once given, and which are all due to invasion of the pilo-sebaceous crypts by pus-cocci. These pyogenic organisms may be either primarily or secondarily effective in producing the symptoms of the disease. In many cases a suppurative folliculitis follows the disorders included in the group last named. A *bacillogenous* sycosis is described by Tommasoli.¹

Hyphogenous Sycosis (Barbers' Itch, Ringworm of the Beard) is due to the presence of the trichophytons (*Trichophytosis Barbæ*). It is described in this work among the Tineæ.

Lupoid Sycosis, Ulerythema Sycosiforme, etc. A group of scar-leaving sycosiform dermatoses may also be recognized which differ somewhat from those named above. They include the pseudo-sycoses, the eczemas limited to the region of the beard with acneiform features, the eczemas of the same region with seborrhœic complications, certain forms of lupus erythematosus of the beard, and the still rarer sycoses possibly due to tuberculous infection of pustular lesions of the bearded face.

COCCOGENOUS SYCOSIS.

("NON-PARASITIC" SYCOSIS, SYCOSIS VULGARIS, SYCOSIS STAPHYLOGENES, MENTAGRA, FICOSIS, FOLLICULITIS BARBÆ. *Ger.*, BARTFINNE, BARTFLECHTE; *Fr.* SYCOSE.)

Symptoms.—The lesions appear upon the face, involving one or both cheeks successively or simultaneously, the chin, the upper lip, the eyebrows, the scalp, the axillæ, and the pubes. The disease, however, is almost always limited to the region of the beard in men. In this respect sycosis differs from acne and other disorders of the sebaceous glands of the face with which authors have sought to identify it, since not only is it, as a rule, strictly limited to the region of the beard, but also the non-hairy portions of the face of the patient are free from comedones, acne-lesions, and other symptoms of a cutaneous disorder.

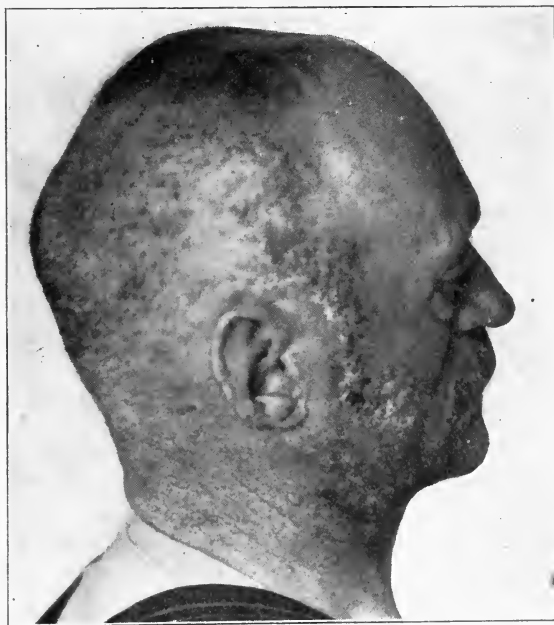
When seated upon the upper lip the first symptoms may be those of a nasal catarrh; seated elsewhere an eczematous attack may precede the onset of the disease. It may be ushered in with the acute symptoms exhibited in the early stage of some forms of eczema, and with tumefaction accompanied by a sensation of heat and burning; but often a few isolated and indolent lesions, the presence of which scarcely awakens attention, are the first traces of the disorder. Soon there may be

¹ Monatsh., 1883, vii., p. 403.

recognized a larger or smaller number of discrete, pin-point to split-pea-sized, flattened or conical, reddish and painful papules, tubercles, or pustules, the anatomical seat of which is distinguished as the pilary follicle because of the penetration of each lesion by a filament of hair. These lesions may persist, and when typically discrete and visible at the part at which the hair makes its exit from the duct of the follicle they suggest the appearance of the surface of the fig, whence the disease derives its name. They are apt to occasion a burning and at times a decidedly pruritic sensation when, being picked or torn open by the fingers, the pus concretes into a crust at the base of the hair. In severer cases these lesions, while not coalescing, are so closely set together as to form a patch of continuous infiltration. These patches may be weeping or be crusted; in the latter case the crusts are apt to be small and numerous, each crust being limited to the shaft of a single hair, and leaving when removed a minute crateriform excavation at the mouth of the follicle.

Involution of several lesions may be followed by fresh crops, and, sooner or later, distinct patches of disease are thus formed. When

FIG. 200.



Sycosis vulgaris.

fully developed the surface of the skin is reddened, swollen, infiltrated, and thickened; covered irregularly with papules, pustules, crusts, and scales, and frequently with excoriations. The disease often lapses into chronic conditions, usually the result of improper treatment, and in ancient cases the deformity is characteristic and

totally unlike that produced by the vegetable parasites. The hairs are usually fixed firmly in their follicles, but from those in which active suppuration is in progress the hairs may be plucked without occasioning much pain. In cases which have been treated for years the hairs are thinned and decidedly lack vigor.

In typical and neglected cases of long standing, in which the region of the beard is involved, an important clinical feature is the symmetrical, general, and uniform involvement of the entire surface. The picture of one cheek is very nearly that of the other. The sparse hairs scarcely serve to disguise the reddened, tumid, painful surface beneath, which displays the severe lesions of the malady. Furuncles, abscesses, cicatrices, vegetations, and eczema of the ears may complicate the process. Sycosis is occasionally acute in its course, but is more often chronic and rebellious. A typically chronic and untreated case of the malady rarely terminates by spontaneous involution.

The thinning of the hairs, described above as a consequence of long persistence of the disease, is far more characteristic than any distinctly resulting alopecia; the latter, however, very rarely occurs, but is then remediless. The same may be said of resulting cicatrization, which is one of the rarest consequences, and which is generally due to bacillogenous infection.

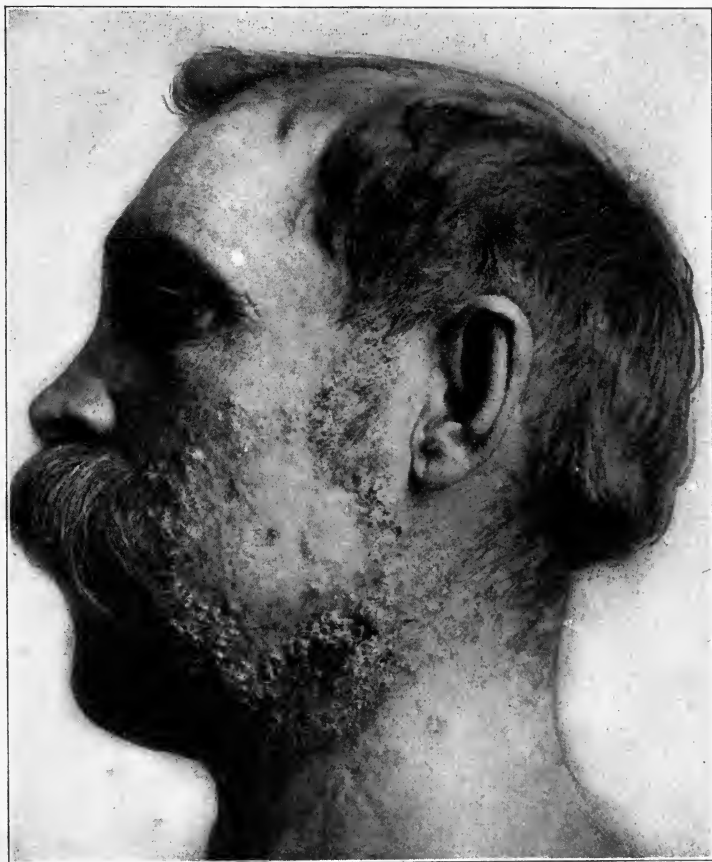
The absence of certain symptoms in this disorder is as significant as is the presence of others. Adenopathy of the cervical glands is very rare, but when present it should awaken suspicion of another malady. The disease when of longest persistence as to time produces great unsightliness, but not the deep-seated, subcutaneous, small- or large-nut-sized nodules or tubercles, forming the "lumps" so characteristic of trichophytosis of the beard. Sycosis vulgaris is a disease of chronic course, which may endure for years and be characterized by relapses and aggravations, but is entirely curable; it is only in neglected and improperly treated cases that such persistence may be expected.

Scar-leaving Sycosiform Dermatitis (*Lupoid Sycosis, Ulerythema Sycosiforme, Séborrhée dépilante*).—Under these titles has been described a somewhat rare affection of the skin of the bearded face in men, the symptoms of which at the outset are practically those of sycosis vulgaris. In the course of the disease, however, whether in consequence of an added infection or as the result of the evolution of the malady, a change occurs in which the hair-follicles atrophy and considerable scarring results. The scars are often irregularly depressed between ridges and linear elevations of the surface. By Unna this dermatosis is grouped with a class of disorders to which he has given the title of "ulerythemata." The disease is at times a tuberculous complication of ordinary sycosis or one dependent upon the presence of tubercle-bacilli, as we have had occasion to demonstrate. The course of the affection is exceedingly chronic, lasting, with alternations of improvement and aggravation, for several years. According to Robinson, the inflammation in these cases spreads peripherally

upward or downward with a narrow infiltrated margin. The lesions outside of the follicles may be papular, vesicular, or pustular in type. The tendency to extension from a given centre and to irregular scarring are the chief characteristic features of the malady.

Many of these cases strongly suggest in their features the symptoms of lupus erythematosus. In some instances the two affections

FIG. 201.



Lupoid sycosis.

are indistinguishable. The malady is exceedingly obstinate and often requires severe local treatment.

Etiology.—Sycosis vulgaris is unquestionably due to either primary or secondary invasion of the pilo-sebaceous follicle by microorganisms. Obviously in many cases there is a special reason for the accessibility of the germs to the crypts where they are lodged. Shaving, and the use in common of towels, brushes, combs, etc., in public establishments (club-houses, barber-shops, hotels), and the employ-

ment of pillows, lounges, and reclining-chairs in public resorts are often the origin of the mischief.

The disorder is encountered chiefly among men after puberty, and in those of all social conditions and grades of health. It is not transmissible by heredity. The mere performance of shaving is not known to produce it. At times the immediate cause of the disease is recognized when the upper lip is constantly irritated by a discharge due to profuse nasal catarrh. In other cases, again, all the causes of eczema may be invoked in explanation of the result.

A careful study of many cases suggests that the hairs themselves are among the aggravating causes of the disease and the sources of its peculiar obstinacy. In health the motions of the free shaft of the hair do not irritate the follicle in which it is set; in conditions of disease it is quite different. Each free hair operates like a lever upon the inflamed ring-tissue which encircles it on its escape from the follicle beneath, and thus by the touch of the hand, by the action of brushing, by currents of air, or by any agency whatever, movement may be imparted to it. Every such movement teases to a variable degree the previously irritated surface beneath; and when estimate is made of the hundreds of such movements to which each hair is subjected during a period of twenty-four hours, the relative importance of this apparently insignificant factor may be appreciated.

Pathology.—The disease is due to pyogenic cocci exciting an inflammatory process, which, whether originally follicular or perifollicular in seat, may extend either toward or from the follicle. Sometimes extraction of the hair is followed by a drop of pure pus which exudes from the follicle, and the root-sheaths of the hairs are seen to be altered in consequence of the circumscribed follicular abscess. At other times the follicle itself is free from disease, and the exudative process has evidently expended itself upon the perifollicular or even the interfollicular tissues, in which case the papillary layer of the derma exhibits the usual phenomena of hyperæmia, infiltration, and multiplication of protoplasm, with abundant vascular dilatation.

According to Robinson, the disease always begins as a perifollicular inflammation, under the influence of which transuded serum penetrates the follicle. Maceration and eventual destruction of the root-sheath of the hair result with the ultimate production of pus within and without the follicle. The pus, when the hair remains in the follicle, finds its way to the surface by breaking through the epidermis near the hair; occasionally exit is obtained between the shaft and the follicle-sheath.

The hair-papilla usually escapes destruction, so that permanent alopecia seldom follows. The sebaceous glands are occasionally involved and even destroyed, but the coil-glands are affected in exceptional cases only. The hair, according to Unna, is closely encapsuled by horny cells which surround the neck of the hair-follicle, like a horse-collar. When pus is formed in the cutis, colonies of cocci spread from about the neck of the follicle into the cutaneous abscess and

sometimes as deeply as the hypoderm. The cocci may also accumulate within the follicle. In total suppuration of the follicle the tightly packed cocci fill the hair-fissure, occupy the centre of the follicular abscess, and extend parallel to the skin on the under margin of the abscess.

The microorganisms recognized (by culture and reinfection) as the effective agents in the production of Tommasoli's bacillogenous sycosis were bacilli with rounded extremities presenting an elliptical or ovoid appearance. They measured 1.0 to 1.5 by 0.25 to 0.3 μ . The symptoms clinically resembled those of coccogenous sycosis.

Diagnosis.—The most important consideration here is the distinction between the coccogenous and the hyphogenous diseases of the region of the beard, upon which point, naturally, the microscope finally decides. Still the clinical features of the two affections are quite distinct. The coccogenous form is recognized: (a) by the greater redness of the involved surface; (b) by the extension of the disease in advanced cases to larger areas of symmetrical involvement; (c) by the more superficial character of the lesions; and (d) by the firm implantation of the hairs in their follicles in the earlier periods of the disease, their relative freedom in all cases from fracture, and the absence of stumps. The hyphogenous disease of the hairs is peculiar, in consequence of: (a) decidedly less redness of the surface attacked; (b) the frequent limitation of the malady to a circumscribed area, or to several such, irregularly dispersed over a large region; (c) the peculiar "lumpy, tubercular, nodular, and uneven" characters of the patch, upon which Duhring has laid significant emphasis; and (d) the earlier loosening of the hairs in their follicles, as also of the occurrence of fractured hairs and of stumps, exhibiting usually at the bulb unmistakable evidences of the nature of the disease. The malady is often mistaken for syphilis, chiefly on account of the unsightliness it produces; but the pustular syphiloderm is very much less chronic in its course, is rarely limited for years to the face exclusively, and, when long persistent in one locality, is characterized by ulceration and the production of very characteristic crusts.

Eczema may complicate the coccogenous disease by preceding or by following it, but typical instances of the two disorders may be recognized by the occurrence, in the case of eczema, of a discharging disease, not usually limited to the region of the beard, characterized by a more intense itching, and with marked absence of the papulo-tubercular lesions described above. The lesions in eczema, moreover, are not invariably perforated by hairs. The shaven face affected with erythematous eczema is reddish in color, and desquamates, after full evolution of the disorder, without pustulation.

Treatment.—Fox¹ Gildersleeve² and Schamberg³ have reported such good results from the use of staphylococcus vaccines that their employment is at least worthy of careful consideration. Radiother-

¹ B. J. D., 1907, xix., p. 420.

² J. C. D., 1907, xxv., p. 320.

³ Sixth, Internat. Derm. Cong., p. 290.

apy is also a very effective method of treatment. The technique is that recommended for acne, except that a harder tube is employed. The treatment is carried to the point of producing a slight erythema and fall of the hair. In the majority of cases from four to eight exposures suffice and the reaction subsides within six weeks. The hair returns usually in about two months. In one case of lupoid sycois of seven years' duration the active lesions disappeared and the scars became much less conspicuous. In several other instances of this disorder this method of treatment has been of special value.

In all cases of sycois, except those treated by *x*-rays, the essential and important step is the continued removal of the hairs which, as indicated above, are the chief sources of aggravation of the disease. This removal is accomplished best by epilation or by shaving, which, though often painful at the onset, soon is tolerated well by the sufferer. The majority of patients, however, object to the removal of the beard, far more on account of the consequent greater exposure to view of the unsightliness induced by the disease (then no longer partly masked by the hairs) than on account of the distress occasioned by the operation. To these objections there is but one response—the shaving is essential; the deformity is relieved rapidly after its successful initiation; the discomfort diminishes with each repetition of the process. For the disease in patients positively refusing to have the beard removed, whose cases are so severe as to require it, the practitioner will do well to decline to be responsible. There is no limit to the tedious and obstinate course of the malady in the one case, and in the other the results are speedily satisfactory, often in the course of a few weeks.

When there is much tenderness, pain, swelling, pustulation, or crusting, the hairs may first be clipped short, and a bland poultice of oil, elm-bark, or of bread and milk applied. The practice in Vienna is to substitute for the poultice, strips of soft muslin or linen spread with diachylon ointment, firmly bandaged over the cheeks, chin, or lips for from twelve to twenty-four hours, after which a razor is passed over the entire surface. The integument which thus becomes visible is usually a reddened infiltrated area, with pustules, papules, pustulo-papules, and some crusts dispersed here and there over it. After exit is given to all purulent collections this area is best treated by hot-water lotions, borated or alkalinized, and then a bland ointment is to be applied at night and a borated dusting-powder in the morning. Formalin lotions of the strength of 1 to 2 per cent. are valuable in all stages of the disorder. The subsequent treatment is largely that of eczema of equal grade of severity. In the more acute periods oleated lime-water, medicated with calomel or with zinc oxide, $\frac{1}{2}$ to 1 drachm (2–4.) of either to the pint (500.), may often be employed with benefit; or for this application may be substituted 2 ounces (60.) each of linseed-oil, Castile soap, and paraffin, to the pint (500.) of liquor calcis. Later, the Lassar paste or ointments may be used, particularly cold-cream salve, to which may be added either

sulphur, zinc oxide, or, less preferably, one of the mercurials. Lotions of mercuric chloride, sulphur, alcohol, cologne-water, or iodated glycerin may be useful in stimulating indolent patches of infiltration. The treatment of these patches is indeed that of chronic eczema.

Epilation is often essential for relief of the disease; and in chronic cases severe methods have been employed, including the use of green soap, tar, and cauterization with acetic and even with nitric acid. Erasion with the curette is to be named in the same category. These measures have been employed in aggravated cases; but as the disease is certainly curable in a majority of patients without having recourse to these heroic methods, they are to be regarded in the light of a *dernier ressort*. It is not necessary in the majority of coccogenous forms of sycosis either to epilate or to employ caustics. By repeated and frequent use of hot borated water, formalin lotions, and the milder stimulants, with constant shaving, the desired result is usually within reach. Shaving should be continued for nearly a year after all traces of the disease have disappeared; and it is a point of some importance to substitute for a fatty application a continuously applied borated powder as soon as the skin will tolerate the persistent use of the latter.

Van Harlingen advises for acute cases a wash composed of $\frac{1}{2}$ pint (250.) of rose-water, to which 1 drachm (4.) each of precipitated zinc carbonate and zinc oxide in powder have been added, with 2 drachms (8.) of glycerin and dilute liquor plumbi subacetatis. Veiel recommends a solution of pyrogallol (1 part to 50) for painting over the region affected, followed in the day by emollient cataplasms and in the night by diachylon or weak tannin ointments. Sycosis of other portions of the body is to be treated as described for the region of the beard.

Internally, treatment, when indicated, should be of the kind demanded by the condition of the patient. It is a matter worthy of special attention, however to purge every previously treated case, of suspicion of artificial element, by withdrawing for a time all internal medication. The disease is so disfiguring that many patients swallow potassium iodide, arsenic, and other deleterious drugs for months before consulting one who is wiser than they in these matters. Exposure of the face to dust, smoke, wind, and other sources of irritation should for a time be avoided.

In the hygienic management of these cases all use of tobacco and alcoholic beverages is to be abandoned. Even the drinking of hot tea, coffee, and stimulating beverages of other kinds is to be interdicted. The diet should be of the simple character recommended in eczema. Inasmuch as many patients suffer from a coincident nasal catarrh, hot baths should be exchanged for daily cold sponging of the body-surface, for patients able to endure the shock, followed by brisk friction with flesh-brush or with coarse towels.

In acute cases it may be desirable to begin treatment with a brisk mercurial cathartic; the alkaline diuretics advised by authors will, at

least, do no harm if judiciously employed. The same may be said of calx sulphurata and minute doses of calomel in the pustular stages of the affection. But in other cases cod-liver oil and iron are demanded by the general condition of the patient, usually one of the class exhibiting the evidences of "hospitalism." No firm believer in the coccogenous etiology of the disorder will, however, expect by these measures alone to relieve the disease.

Prognosis.—The disease is entirely curable, and will, in the large majority of all cases, either disappear entirely or greatly be improved by judicious treatment. The latter requires the personal supervision of the physician and close attention to details.

In exceptional cases the disorder is exceedingly chronic and obstinate, and requires perseverance on the part of both physician and patient to attain the desired end. Relapses are of frequent occurrence, due usually to neglect of asepsis after apparent recovery. In a few very rare cases (lupoid syphilis, tuberculosis) there is cicatricial tissue left after repair.

FOLLICULITIS ATROPHICANS.¹

This term is employed to designate a class of disorders characterized by disease of the hair-follicles terminating in their atrophy. We are especially indebted to Brocq for what little is known regarding these rare affections. The group includes:

Ulerythema Ophryogenes (Gr. *ὄυλη*, scar; *ἐρύθημα*, redness; *ὄφρυς*, brow).—This affection was described first by Taenzer² in Unna's clinic. According to Unna, it occurs most frequently in blonde infants, is located usually in the eyebrows, from which it may spread to adjacent parts, including the scalp, or it may appear on the extensor surfaces of the upper arms. The condition may be no more than a persistent erythema, with small, elevated, horny papules at the mouths of the hair-follicles. The hairs are finer than normal and usually are broken off close to the surface. The disease may persist for years without further change, but in the severer forms superficial inflammation, atrophy, both follicular and interfollicular, results, so that small depressed scars are surrounded by, or commingled with, the hyperæmic areas. The resulting alopecia is permanent and may be very marked, especially on the eyebrows.

The disease is said to be rebellious to treatment. Internally a ferruginous and arsenical treatment has been adopted with local applications of resorcin, salicylic acid, the mercurials, and stimulating shampooings with soap.

Quinquaud's Disease³ (*Acné Décalvante* of Pailler and Robert). Here miliary abscesses, punctiform, pinhead-sized and larger, involve the follicle. The hair originally piercing these suppurative lesions is

¹ Cf. *La Pratique Dermatologique*, vol. i., p. 335.

² *Monatshefte*, 1888, No. 5.

³ *Bull. de la Soc. méd. des Hôp.*, 1888, s. iii., v., p. 395.

loosened and falls, after which the follicle atrophies and the hair is no longer produced. The scalp is left dead-white, thinned, depressed, atrophied, and cicatriform, in patches as large as those visible in alopecia areata, but often irregular in outline. The follicles remain distinct and are not fused into a mass; they resemble the distribution of the lesions in coccogenous sycosis. In some instances this special follicular alopecia and scarring have progressed without suppurative involvement of the follicle, and in cases without any signs of inflammation.

Alopécie Cicatricielle Innominée (*Pseudo-pelade*) consists of a slight inflammation of the scalp in patches leaving permanent alopecia. In these cases the scalp about one or several hair-follicles becomes tumid and reddened. The hair is loosened in its pouch, and, whether it fall spontaneously or be removed by epilation, it is not replaced by another. The scalp is left whitish, smooth, ivory-like, depressed, thinned, insensitive, and apparently atrophied, without trace of the new-formed downy hairs often noticed in alopecia areata. As distinguished from the last-named disorder, the advance of the patch may be in irregular lines rather than by extension of the rounded or oval circles formed in alopecia areata. Minute islets of bald areas exhibit the outlying evidences of disease.

Etiology and Pathology.—There can be no question that some of the cases designated in the group of affection's outlined above are instances of lupus erythematosus of the scalp. Some of them exhibit the border, the color, the thickening, and the characteristic stippling of patches of that disease. Until lupus erythematosus of the scalp has been studied exhaustively, its existence in this region, when there are no facial or other lesions to indicate its character, will scarcely fail to be misunderstood.

Diagnosis.—The diseases which must be excluded carefully in the presence of a given case are: lupus erythematosus, lichen planus limited to the scalp which is very rare, scleroderma and post-impetiginous scars of the scalp. A careful consideration of the symptoms of these diseases is required in every case.

Treatment.—The internal and local treatment is practically that of alopecia already detailed. Clipping, epilation, the application of parasitocides, and the remedies advocated in alopecia seborrhoica are often useful. Sulphur, resorcin, the mercurials, salicylic acid, and iodine all have been employed with success. Corrosive sublimate lotions, 1 in 400, boric acid lotions, and powders are useful. Galvano-cauterization of the pustules and inflammatory points has been employed successfully in some of the reported cases. All these disorders are well managed if treated in accordance with the principles suggested in the section on Sycosis.

Prognosis.—The disease is often severe, obstinate, deforming, and rebellious to treatment. The prognosis of the lupoid sycosis type promises to be improved greatly by the employment of radiotherapy. The resulting alopecia in most forms is remediless.

KELOID-ACNE.¹

(SYCOSIS NUCHÆ NECROTISANS, DERMATITIS PAPILLARIS CAPITULI. *Fr.*, ACNÉ KÉLOIDIENNE; *Ger.*, NACKENKELOID.)

Under this title Kaposi² describes a disorder characterized by pinhead-sized, isolated or confluent elevations of the skin-surface, with interspersed pustules, which finally form cicatriform plaques over which the hairs are either clustered in tufts or are totally absent. The pilary filaments are atrophied yet firmly fixed in their follicles, and they suffer elongation or fracture before withdrawal. The disease is encountered chiefly upon the nucha, the occiput, and the vertex. Papillomatous vegetations, crust-covered, hemorrhagic, and with a foul-smelling secretion, sometimes form, and eventually retract into a sclerotic tissue.

I have described typical cases of this disorder,³ each of which concluded with the production of a keloid-like, cicatriform, irregularly shaped but circumscribed elevation of the surface. This feature is that by which it specially differs from all other sycosiform disorders. The disease seems to be due fully as much to inflammatory processes in the subcutaneous tissue between the unyielding pericranium and the thick scalp as in the derma proper, and therefore it is not, strictly speaking, a dermatitis. Puncture, for example, of one of the pinhead-sized pustules commonly gives exit to the usual quantity of pus; but pressure upon the scalp in the periphery will at once be followed by the appearance of a still larger quantity of similar pus which evidently is expressed from a circumscribed subcutaneous abscess. When by such pressure the abscess-cavity is emptied it slowly fills with venous blood and produces a firm, semisolid elevation of the surface that subsequently undergoes sclerosis, and the starved hairs above behave in the manner described by Kaposi. The papules and plaques are formed in a similar way by the abundant supply of venous blood. The case of one of the patients presented at the clinic had been erroneously diagnosticated by a surgeon as aneurismal in character. Puncture of all such semisolid, cicatriform lesions is invariably followed by oozing of venous blood in abundance. The disease is chronic in character, is particularly liable to relapse in crops of pilary or peripillary pustules and papules, and it extends from nucha to vertex, avoiding the frontal and temporal regions. Over the bald or partially bald keloid-like elevations there is seen, in some cases, a species of seborrhœa in the form of more or less adherent, fatty crusts, with occasional characteristic tufts of hairs.

The disease seems to owe its special character to the anatomical peculiarities of its location. It occurs preferably at the points where the venous supply of the scalp is not only greatest, but where it is

¹ For a survey of the literature, with clinical and histopathological report, see Porges, *Archiv*, 1900, lii., p. 323.

² *Treatise*, Wien, 1880.

³ *J. C. D.*, 1882, i., p. 33.

also in most direct connection with the large vessels beneath, and where an inflammatory process in the derma or subcutaneous tissues invites with readiness a pathological afflux of blood. Such a focus, limited beneath by the dense calvarium, and above by the relatively thick scalp, readily undergoes organization and sclerosis, the subsequent behavior of the hairs and fair-follicle being an accident of the process.

According to Besnier and Doyon, the disorder is a papillomatous development, likely to occur in this region of the scalp as a sequel of epilation, cicatricial (keloid) acne, eczema, or traumatism.

Sangster (in a paper read before the International Medical Congress in London, 1881) described a pigeon's-egg-sized tumor of the scalp, that Kaposi, who was present, recognized as a case of dermatitis papillaris capillitii. Crocker describes in detail a similar case, an occipital lesion measuring three and one-half by two and one-half inches.

Ehrmann¹ believes that this affection is simply the terminal stage of coccogenous sycosis. Samberger² has described the malady affecting the follicles of the beard.

The therapy of this rare disease can scarcely be described as established. Internal treatment is suggested by the constitutional condition of the patient, and it should often include cod-liver oil, the ferruginous tonics, and a roborant regimen. The affected surfaces are freed first from subcutaneous abscesses by puncture and expression of the contents. Then the patch is washed with hot carbolized water, dusted with boric acid or iodoform, and a compress, moistened with an antiseptic solution, such as corrosive sublimate wash, is bandaged firmly over the part. When pathological fluids no longer form under the scalp the patch is best epilated and anointed with a salve containing 1 drachm (4.) of precipitated sulphur to the ounce (30.) of scented vaselin, which salve may also be kept constantly over the part. When crusts form they may be removed by shampooing with green soap. Other methods of local treatment advised are: electrolysis, linear scarification, erosion, excision, and electro-cauterization.

The favorable results obtained with the x-rays in acne and in keloid suggest the use of radiotherapy in keloid-acne. We have used the method in two cases, succeeding in both instances in arresting the active process and in causing a partial disappearance of the disfiguring scars.

DECIDUOUS HAIR SHEDDING.

Ledermann³ has reported the case of a girl twenty-two years old, who shed her hair every winter; in summer it would grow again. One winter she became entirely bald and in summer her hair did not grow as usual. Severe alopecia affected the body. This began as circular patches when she was twelve years old.

¹ Archiv, 1895, xxxii., p. 324.

² Archiv, 1907, lxxxiii., p. 163.

³ Berl. klin. Woch., 1903, p. 332.

THE NAILS.¹

The importance of a careful study of the diseases of the nails can scarcely be overestimated. These appendages to the distal phalanges of the hands and feet are involved, slightly or seriously, in most of the morbid changes in the general economy; and exhibit also pathological features limited to the nail-organs themselves. Singularly sensitive, they give response to almost every one of the traumatisms, the invasions, and the reactions of the human body.

Surveying the diseases of the nails as a group, certain general considerations are noteworthy, apart from a formal enumeration of the etiological factors efficient in different cases, as explaining alike the vulnerability of the nails and the special opportunities for their involvement.

Of all organs of the body, the nails are furthest distant from the circulatory centre and thus, in a remarkable degree, acknowledge the influence of both slight and serious embarrassments of the vascular currents. At the same time, as a consequence of the isolation of the digits on which they are implanted, they share with the ears the dangers of exposure to low temperatures. These striking facts alone explain a large number of the diseases not due, as in the case of parasitic invasion, to a morbid process limited to the nail-organ.

In most individuals of civilized races, the act of locomotion brings special stress to bear upon the toes through the medium of the artificial coverings worn upon the feet. In persons wearing no protection of that character, the toe-nails share with the finger-nails, but only in minor measure, the chances not merely of direct infection, but also of furnishing, for a variable period of time, lodgment for microörganisms beneath the free border of the nails and in the nail-folds. In the vast majority of members of the human family, the infant, the child, and the man during all the wakeful hours of the day, bring the finger-nails into intermittent contact, both with other exterior regions of the body and with the objects in its immediate environment. The nails, therefore, not only suffer from many diseases affecting the general economy as well as from morbid conditions limited to the nail-organs themselves, but also are often the agents by which infective processes are awakened in distant but accessible regions.

¹ Recent literature on Diseases of the Nails in general: Heller, *Die Krankh. d. Nägel*, Berlin, 1900, with 71 illustrations and bibliography to date of publication. Heller, *Mraček's Handbuch*, 1907, vol. iv., ii., p. 538, with additional bibliography to date of publication. Shoemaker, *J. C. D.*, 1890, viii., pp. 334, 388, 419, 476, with references and abstracts. Montgomery, *D. W.*, *Twentieth Century Pract.*, vol. v.; *Trans. Amer. Derm. Assn.* (symposium on Dis. of Nails, Grindon, Pollitzer, Zeisler, Hardaway), 1901, p. 111. Radcliffe-Crocker, *Dis. of the Skin*, 3d and Spec. Illd. Ed., 1905, p. 1248, with good portrait of onychogryphosis, *Atlas*, pl. xc. Pernet, *Encyclop. Méd.*, vol. viii., 1901, with bibliography; *Atlas of Ill. of Med., Surgery and Path.*, London, New Syd. Society. 1906. *Hutchinson's Arch. of Surgery*, 1890-1891, vol. xi., p. 237-253. Dubreuilh, *La Prat. Derm.* Besnier, Brocq, Jaquet, Paris, 1902, p. 607, art. *Ongle*, with illustrations.

CONGENITAL ANOMALIES OF THE NAILS.

Anonychia (Gr., α , privative; $\acute{\omicron}\nu\chi$, nail).—Nail-plates may be wholly or partially absent in the new-born, even with normal development of phalanx, nail-bed, and nail-fold. Very rarely all the nails, in a few instances one or several of those of the fingers or the toes have been wanting. Cases of congenital anonychia are on record in which in after life, the nails did not develop. In other instances, nails existing at birth have soon afterward been shed without further production of nail-growth. Again, the new-born suffering from intra-uterine affections of the skin may exhibit a loss of nails due to such congenital disease, as in severe grades of ichthyosis ("harlequin fœtus"), variola in utero, etc.

Polydactyly and Syndactyly (Gr., $\pi\omicron\lambda\upsilon\varsigma$, numerous; $\sigma\acute{\upsilon}\nu$, together; $\delta\acute{\alpha}\kappa\tau\upsilon\lambda\omicron\varsigma$, a finger or toe).—Supernumerary fingers and toes commonly have properly adjusted nails; in some such anomalies, however, the nails have been wanting; in yet others double nails have existed on the supernumerary digit. In a case of infantile syndactylism recently submitted to us, two fingers of one hand were enveloped in a single web; the nails were normal and skiagraphy showed proper phalanges. Often, however, the nails of such conjoined digits are fused. In yet other cases claw-like nail-plates are developed.

Onych-heteropia (Gr., $\acute{\omicron}\nu\chi$, nail; $\epsilon\tau\epsilon\rho\omicron\varsigma$, different).—In rare cases, where rudimentary fingers and toes have been implanted elsewhere than upon the hands and feet, nails have been produced in anomalous situations.

ABNORMAL CONDITIONS OF THE NAILS ASSOCIATED WITH CONGENITAL CUTANEOUS AFFECTIONS.

Diseases of the nails in this group, aside from anonychia mentioned above, are occasionally exhibited in new-born infants. The most of these cases illustrate the changes described below under the titles onychauxis, onychogryphosis, and onychatrophy. At times one or more, rarely all, the nails of both hands and feet are defective in production of the horny substance of the nail; or the extremity of a bulbous and deformed digit may be capped with greatly enlarged nails; or with nail-plates forming upward-projecting, horny, peg-like structures; or a well-marked sub-ungual keratosis may have been determined. The congenital affections of the integument most often concurrent are: ichthyosis of the so-called "hystrix" type, pityriasis rubra pilaris, lepra, and, very rarely, syphilis. With these anomalies may exist partial or total absence of hair from the scalp, brows, and other regions of the body, as also failure of eruption of the teeth.

Onychomadesis (Gr., $\acute{\omicron}\nu\chi$, nail; $\mu\alpha\delta\acute{\alpha}\omega$, to make bald).—Montgomery¹ reports a case of hereditary continuous shedding of the finger-nails in a male patient thirty-five years of age troubled in this

¹ J. C. D., 1897, xv., p. 374.

way from birth. The nails of the mother and two maternal uncles had been similarly affected. In this case there had been albuminuria. One or two of the nails were constantly falling after a yellowish-white change in the lunula. There were no subjective sensations.

Pachyonychia congenita (Gr., *παχύς*, dense; *ὄνυξ*, nail).—Under this title Jadassohn and Lewandowski¹ describe the case of a girl fifteen years of age affected with onychogryphosis of the nails of both the fingers and toes, which were somewhat thickly stained though

FIG. 202.



Onychogryphosis in a leper, a Hindoo afflicted with the neural form of leprosy.
(DOUGLASS W. MONTGOMERY.)

generally transparent, but which were thickened to the extent of from three to five millimeters. The density of the structure was such that the free extremities of the plates could not be cut with ordinary scissors. This condition had existed since birth. There was present hyperhidrosis of the hands and feet as well as of the nose, and yellowish-white transformation of the epidermis of the soles of the feet where there had been maceration (*cf.* the acquired form of compensatory onychauxis). There was coincident leukokeratosis of the tongue and circumscribed follicular disseminate keratosis of the skin.

Onychogryphosis congenita (Gr., *ὄνυξ*, nail; *γρυπός*, crooked).—Simpson² describes the case of a child eleven years of age, whose nails, both of the fingers and toes, since birth, projected upward from one-

¹ *Ikonographia Dermatologica*, Fasc. 1, Tab. 1, viii., p. 29.

² *Lancet*, April 14, 1888, p. 722.

half to three-fourths of an inch. There was no explanation of the anomaly furnished in the history of the patient or her family. A similar instance is reported by Zeisler¹ in an infant of three months.

FIG. 203.



Onychogryphosis. (DOUGLASS W. MONTGOMERY.)

The two cases presented a striking similarity in that in each instance a serum-like oleaginous fluid escaped when the nails were cut.

ACQUIRED DISEASES OF THE NAILS.

Onychatrophia (Gr., *ὄνυξ*, nail; *ἀτροφος*; Fr., *Onychatrophie*).—Atrophy of the nails is always a symptomatic condition, due either to a local or systemic influence whereby the formation of the horny material of the nail is rendered either wholly abortive or defective. In these cases the nail-plates may be changed in bulk, color, elasticity, firmness, shape, or position. They may be thinned and expanded, narrow and acuminate, friable, furrowed, laminated, ridged, or in other ways distorted. They may be striped, irregularly speckled, lustreless, or have a characteristic dull yellowish color with "worm-eaten" aspect. In other conditions the nails are split, or even crumbling, so that the relics only of the nail-substance are visible near the

¹Loc. cit., p. 128.

matrix, one-half or more of the distal flange having disappeared. In yet other cases sparse, horny spurs, "flakes" or pegs, of a dull greenish or dirty hue project from the proximal portions of the nail-bed.

Hapalonychia (Gr., ἁπαλος, soft; ὄνυξ, nail).—Under this title Kaposi has described a condition of atrophy in which through defective nail-production the plates become softened and correspondingly weakened, being thus the more readily split and folded. In a striking instance of this anomaly shown at our clinic in the person of an elderly man in an advanced stage of nephritis, the softened nail-plates were thrown into flutings and folds. Under the title *Koilonychia* ("Spoon-nails," Ger., *Aushöhlung der Nägel*) still another atrophic condition has been described by Radeliffe-Crocker,¹ James, Rille² and others in which the plates, usually of the fingers, are thinned and present a transverse concavity with everted edges, the hollowing being at times longitudinal. This anomaly has been observed, as in other atrophic states of the nail, in connection with wasting diseases, but the etiology is often obscure.

Onycholysis (Gr., ὄνυξ, nail; λύσις, loosening; Fr., *Décollement des Ongles*).—Partial loosening of the nail from its bed occurs (*a*) when the plates are only partly dislocated, a condition affecting chiefly the proximal portions, which may be seen lying loosely connected with the extremity of the digit by the nail-folds or the distal attachments; (*b*) when but a few of the nails either of the hands or the feet are involved. In this partial form the great toe is most often attacked. In some of the recorded cases³ the general health seems not to have been impaired. Often, however, the patients are victims of grave neuroses or of wasting diseases. In a middle-aged man under our observation who had been for a long period of time subjected to severe mental strain in connection with his business, all the nails of the fingers and toes were separated from their proximal attachments and held in place solely by slender distal attachments. The nail-plates in some other cases on record were apparently normal; at times they are both discolored and misshapen.

Onychomadesis (Gr., ὄνυξ, nail; and μαδίζω, to pluck out. *Alopecia Ungualis*; *Defluvium Unguium*; *Onychoptosis*).—Total and so-called intermittent shedding of the nails occurs, as in the partial form, in connection with systemic affections of a severe grade. At times the nails are all shed with the skin of the palms and soles as after scarlet-fever of severe type, in generalized alopecia areata, in some renal diseases. Falcone⁴ and others report recurrent inflammatory disorders in which not only the nails but the hairs were shed in successive attacks. Some of the patients thus affected were syphilitic. In a case recorded by Charles White⁵ a dystrophic process

¹ Loc. cit.

² Case cited by Heller, with illustration, p. 136. Die Krankh. d. Nägel, etc.

³ White, J. C. D., 1896, xiv., p. 220; also those cited by Heller, Mraček's Hdbch., 1907, Bd. iv., ii., p. 559.

⁴ Gaz. d. osped. Milano, 1887, viii., p. 156; Giorn. Ital. d. Malate. Ven. e. d. Pella, 1887, p. 206.

⁵ J. C. D., 1896, xiv., p. 220.

occurred in the nails and hair of four generations of subjects. Nicolle and Halipré¹ reported thirty-six individuals in six generations, where atrophic and other nail changes coexisted with scanty, friable, and readily epilated hairs. In a patient examined by us, similar changes were determined in a child who had never experienced an eruption of teeth.

Onychorrexis (Gr., ὄνυξ, nail; ῥήξις, fracture. *Schizonychia*, *Onychoschisis lamellina symmetrica*, "Reedy nails").—Splitting of one or all of the nail-plates usually in longitudinal lines, occasionally transversely to the long axis of the digit, affects in inconspicuous degree many persons. When exaggerated, lines of fracture occur obviously in atrophic depressions between somewhat raised ridges, the plates being eventually split clean through to the matrix. In a male patient under observation, a single plate of the middle finger of one hand persistently and for years split from the free border to a point near the proximal fold. In other cases the nail-plates are lamellated, the separated strata of the nail-substance becoming easily detached. The lamellæ, as in a case recorded by Ehrmann² are commonly roughened, "worm-eaten" in appearance and discolored. These conditions may coincide with systemic infections but in some instances occur as strictly local sequels of malnutrition, as after trauma. Transversely directed furrows in the nail-plates are the frequent and perhaps invariable consequences of impairment of nail-nutrition either systemic or local. One can often date a previously occurring fever, relapses of fever, nervous shocks, attacks of sea-sickness, and even enforced confinement to the bed as during treatment for fractures and dislocations, after careful examination of the nail-plates, exhibiting these transverse furrows at different levels.

Leukonychia (Gr., λευκος, white; ὄνυξ, nail. *Leukopathia Unguium*, *Achromia Unguium*, *Albugo*, "White Spots," *Flores unguium*, "Gift-spots," *Canities Unguium*; Fr., *Décolorization des Ongles*).—Whitening of the nail-plates either in totality, or, more frequently in points, spots, streaks, or bands is not rarely encountered chiefly in young subjects upon the nails of the fingers. At times but one or a few nails may exhibit a single or several points of decoloration; in other instances every nail is the seat of numerous spots or bars, some occupying the larger portion of the plate.

The causes of this anomaly are obscure. In some cases, as in those described by Longstreth,³ Shoemaker (*l. c.*), and Giovannini,⁴ this condition was apparently related to nervous or systemic disorders. Traumatism of the proximal portion of the plate as in the operations of the manicure are believed to be responsible for some cases. In others the leukonychia concurs with patches of vitiligo in other regions of the body surface.

¹ Annales, 1895, s. iii., vi., p. 675.

² Monatsh., 1904.

³ Trans. Coll. Phys. Phil., s. 3, viii., p. 113.

⁴ Reform. Med., Naples, 1891, vii., pl. 2, p. 865.

The pathology of the change is not clear. It is without question in some young subjects a strictly physiological condition. By Heller and others, it is believed that the white spots are due to the entrance of air into the nail-cells, an opinion enforced in a few instances by artificial production of the spots after nicking of the nail. Heidingsfeld supposes the anomaly to be due to failure of proper keratinization of some of the nail-cells.

ONYCHAUXIS.

(Gr., *ὄνυξ*, nail; *ἀυξίω*, to grow.)

(HYPERTROPHY OF NAIL; ONYCHOGRYPHOSIS.)

Hypertrophy of the nail may involve one or more of the organs of both hands and feet, either as an idiopathic or symptomatic affection. The nails may be augmented in length, breadth, or thickness; and changed in shape, density, color, or texture. The term onychogryphosis is restricted by most English authors to the condition in which twisted and otherwise contorted anomalies of nails are thus produced.

Compensatory Onychauxis in Embarrassed Circulation.—Decidedly the most common of all the hypertrophies of the nail substance with production of sub-ungual keratoma, are those associated with and etiologically strictly dependent upon circulatory changes in the hands and feet.¹

The circle of relationship between stimulation of the vaso-motor nerve centres, abnormal intra-capillary pressure, sweating of the hands and feet, and keratomatous alterations in the palms, soles, and nails is not difficult of recognition once the chain of events has been carefully studied. Whatever the ultimate cause, whether a toxine acting primarily upon nerve centers or upon the constitution of the circulating fluids, the clinical fact remains that hyperidrosis of those organs the most distant from the heart, ultimately produces in one form or another, a condition of onychauxis. Seeing that hypertrophy and atrophy of the nail-substance frequently go hand in hand, in order to intelligently appreciate this sequence of events, it is necessary to describe in this connection a first grade of the change, which belongs rather to the atrophic than hypertrophic disorders of the nail, viz.,

“**The Egg-shell Nail.**”—This condition, described by me,² though not directly related to hypertrophic increase of the nail-plate is intimately associated with nutritional alterations consequent upon embarrassment of the circulation. The patients exhibiting these peculiarities have been mostly young women, a few men, the former commonly in delicate health, the latter for the most part in the gouty state.

¹ Cf. Hyde and McEwen, “On the Relation of Certain Dermatoses to each other and to changes in Vascular Equilibrium,” J. C. D., 1904, xxii, p. 547.

² J. C. D., 1906, xxiv., p. 145, with illustrations in color.

The nails of both feet and hands are usually involved and symmetrically, being thin, with a distinct tendency to upward thrusting of the free border after leaving the nail-bed. This free portion is abnormally whitish in hue and suggests the pinkish-white color of the inside of the shell of the hen's egg. Usually the nail-bed as distinguished through the semi-translucent plate, is irregularly shaded in empurpled or whitish streaks. The nails of the toes especially, often exhibit exaggeration of the transverse curve.

These patients are all, in various grades, victims of well-marked hyperidrosis of hands and feet. We have had under observation two patients, mother and daughter, each having hands and feet characteristically wet and cold, with nail-plates altered as here described. The toe-nails are usually sodden, and if cut sufficiently short to prevent the upper thrust of the plate seem to be sunken in the folds. The circulation in all cases is impeded. With or without distinct cardiac disease there is commonly gout, special sensitiveness to narcotico-stimulants (tea, coffee, tobacco, etc.) or anæmia of various types.

Onychauxis with Keratoma and Hyperidrosis (*Tylosis of the Matrix* [Crocker]).—This condition is apparently a more pronounced grade of the symptoms represented in the "egg-shell nail." These organs in both feet and hands are tilted upward and away from the long axis of the digit; they are commonly thickened, discolored, unusually curved transversely, and the subungual space is choked with poorly formed corneous material. This last may be in an infective state from the presence of organisms. The hands and feet thus affected are invariably the seat of hyperidrosis in various grades. At times the skin of these parts is merely unusually damp; in other cases it fairly drips with moisture.

The corresponding keratoma-stage of the skin develops in mild type, in the form of a horny ring about the heel, about the distal limits of the metatarsus, over the palmar faces of the toes, or over the palms and palmar faces of the fingers. In some cases the skin of the entire palm and sole is converted into a dense, dirty-yellowish plate of corneous consistency, at the borders of which spreads a pinkish or reddish halo from passive hyperæmia. In one of our cases casts of the foot were regularly shed. A well-marked variant of this complexus of symptoms is displayed when the keratomatous change involves the entire matrix pushing the nail uniformly upward; or, as in Unna's classical case, forming a sub-ungual tumor buckling the plate upward and producing finally an onycholysis by longitudinal splitting. In yet other cases the characteristic clubbing of the fingers due to embarrassed circulation results—and on these, gryphotic, more or less distorted nails grow, some curving unusually toward the palmar face of the digit, some transversely or longitudinally ridged. Lastly, in extreme cases, the nails are seen to be unusually dense with a natural polish like that of ivory, empurpled in

hue, surmounting clubbed fingers bathed in "icy" moisture and passively congested.

All these conditions are expressions of an effort on the part of the skin of the hand and foot, and of the nails of these organs as well, to protect a constantly moistened, and therefore abnormally vulnerable surface, from the effects of maceration. These processes operate under the impulse of the law of compensation which produces hypertrophy of the heart in an effort to overcome resistance in certain valvular diseases of that organ. All these patients have damp, often excessively wet hands and feet. In all, the keratomatous modification of both matrix of nail and epiderm of palm and sole (the feet more frequently than the hands by reason of their greater distance from the heart) is an effort toward protection of unduly vulnerable because abnormally macerated tissue. The living foetus in utero is protected from maceration by the vernix caseosa, a derivative from the epitrichium; the living hand and foot are fully protected from maceration during hyperidrosis, only when the compensatory keratoma-process is complete.

Non-Compensatory Onychauxis.—Hypertrophy of the nails, not due to the compensating effort recognized above, may produce changes in the nail scarcely to be distinguished from the others. The nail-plate may be increased in all dimensions, uniformly or partially; the thickened nail wholly or in part may exhibit conical upward projections; its borders may infringe upon the nail-folds to the extent of producing there inflammatory changes; the onychogryphotic claw or talon may result, projecting in an ill-shaped contorted mass beyond the free border of the digit, and this with either softening or hardening of the nail-substance. The nails are commonly dull-colored, opaque, yellowish-brown, or dirty-blackish in hue. They are often ridged, rugous, or furrowed; and tilted to one side or upward in recurving lines. The matrix and the soft parts about the nails may be inflamed. The nail of the great toe, by reason of its projection and size, is most often thus involved.

The causes of non-compensatory increase in the bulk of the nail may be purely local, and such as induce irritation of the matrix. Pathologically this process may be declared in small-celled infiltration and the other phenomena of inflammation. The pressure of ill-fitting stockings, shoes, or gloves; filth; neglect; and the exposures producing ("professional") trade-dermatitis of the hands, may be in turn responsible for the condition.

The nail hypertrophies of most common occurrence in connection with cutaneous disorders are considered under the separate titles for each.

Onychia (Onychitis) (Gr., ὄνυξ, nail) is the resultant of inflammation of the matrix or folds of the nail; and may be produced by any of the causes capable of exciting inflammation in other regions

of the integument. Trauma, the pyogenic microorganisms, foreign bodies beneath or within the nail-plate, or parasites—may excite inflammation of the soft parts about the nail sufficient to produce distortion, fall of the plate, ulceration, and even digital gangrene.

Onychia Maligna, whether occurring in children or adults, since the date of modern methods in diagnosis and therapy, has become practically unknown. It may be due to struma, syphilis, tuberculosis, septicæmia, or any infectious process. Commonly an ulcer forms at the border of the nail, which gradually becomes necrotic in floor and edge. A severe phlegmonous process complicates some cases. In a few instances we have recognized that chronic ulcerations in the proximity of the nail were the result of chancroidal infection.

Paronychia (*Panaritium*, *Whitlow*) is that condition in which an infection of either nail-fold or matrix (commonly septic, though all the infections may here operate) spreads to the surrounding tissues with tense painful swelling of the soft parts of an entire digit, inducing eventually suppuration, necrosis, and at times even exfoliation of the bone of the involved phalanx. The disorder is one properly belonging to the domain of surgery, and commonly requiring surgical treatment.

Syringomyelia (*Morvan's Disease*, *Analgesic paralysis with whitlow*, Fr., *Panaris analgésique*).—In this disease a succession of whitlows is associated with analgesic symptoms. The phalanges often fall into necrosis; and other painful or destructive cutaneous symptoms concur. The disorder is supposed by some authors to be a modified lepra.

Unguis Incarnatus (*Ingrowing Nail*) occurs when an edge of the nail-plate impinges abnormally upon the soft parts in the vicinity and excites irritation. The ingrowth may occur to such an extent as to bury the edge of the plate deeply in a sulcus or ulcerated furrow on one side or the other of the soft parts where it operates precisely like a foreign body. Often an exquisitely tender, granulating wound results requiring surgical relief. The condition is one most often occurring in the feet, and particularly in the great toe, because of pressure-effects from the coverings of the feet.

Pterygium (Gr., *πτερόν*, a wing).—The fold of the epidermal structure, which in health furnishes the proximal border of the nail-plate may advance to a greater or less extent over the plate. In adult life, this advance may be due to radiotherapeutic treatment of the fingers when the nails are exposed to the ray. In some cases the condition is the pure result of neglect of hygiene of the nails. In others it may result in a considerable deformity. Heller describes it as at times congenital, the nail of the big toe being set as if in a cap. The treatment is by hygiene of the nails and the use of the cuticle knife.

Hang-nails, “*Ag-nails*” (Ger., *Nietnagel*; Fr., *Envies*) originate from tags of the lateral nail-folds, detached mechanically and torn upward. At times the rift penetrates deeply into the sulcus by the

side of the nail, leaving thus an ample atrium for infection with microörganisms. This may be the first step toward the production of a grave onychia terminating in exfoliation of the distal phalanx. In yet other cases chancres form in the part and syphilis follows. Biting and picking of the nails is a frequent cause of these apparently trivial affections. The treatment is by aseptic dressing, protection by sealing up the small wound, and in severe cases, excision.

Subungual Hæmorrhage is believed by Unna to be responsible for many otherwise unexplained cases of shedding of the nail. In some instances the hæmorrhages are microscopic and appear only on section of nail-tissue. In other cases minute reddish or reddish-black specks become visible beneath the plate. In extreme cases the entire matrix becomes blackish from effused blood. The nail is shed when the process is sufficiently extensive to produce separation of the plate from the bed. Subungual hæmorrhages occur after trauma; in scurvy; in hæmophilia; and in rare disorders of the nervous centres (epilepsy). Removal of the plate may be required in surgical cases.

Subungual Tumor-formation occurs rarely. Dr. Shepard¹ reports a subungual chondroma. Hutchinson, Jr.,² recognized an epithelioma in this situation; Kraske, cited by Shoemaker, a sarcoma. We have seen a number of corns growing beneath the plates. Heller gives details of other subungual tumors recognized by different authors including papilloma, fibroma, leiomyoma, endothelioma, angioma, telangiectases, and angio-sarcoma.

MORBID CONDITIONS OF THE NAILS INDUCED BY CUTANEOUS DISEASE OF THE EXTREMITIES.

Eczema.—There is no eczema of the nail apart from an inflammatory process affecting the soft parts in juxtaposition. In proportion as eczema is one of the most frequently occurring of dermatoses, do nail-disorders develop in cutaneous affections. Further, as most of the eczemas of the hands and fingers result from the occupations of adult life, so are the nail-symptoms of eczema rare in children.

When the parts adjacent to the nail-plates are the seat of an eczema, the latter are well-nigh invariably changed, losing their normal color, and becoming discolored, dirty-yellowish in hue, furrowed, "worm-eaten," split in various directions, and furrowed. The chief change is a marked interference with nutrition. Many of the changes noted are secondary (as in the eczematous skin), the sequels of traumatism, friction, etc., operating upon a weakened surface. Eczemas practically limited to the finger-tips with nail-changes, occur often in workers in chemicals (*e. g.*, in physicians, chemists, photographers), in bar-tenders, laundry-workers, grocers, confectioners, and the like. In right-handed persons, the right hand is commonly

¹ Trans. Amer. Med. Assn., 1901, p. 138.

² Trans. Path. Soc. Lond., xxxvi., p. 468.

most involved and the most employed parts of that hand (thumb, index, and the adjacent fingers in proportionate measure) show the character and grade of the local irritation.

In these cases the symptoms of an inflammatory process affecting the outlying skin are usually distinct (redness, serous exudation, infiltration, crusting, and at times pustulation and undermining of the epidermis).

Psoriasis.—The nails of the hands and the feet, one, several, or all, may be slightly or extensively changed in psoriasis. Most commonly there is a concurrent psoriasis of the general integument; but in rare cases the nails only are involved. There are several types of this localization.

In the most common form the first symptom of a variation from the normal occurs in a distal portion, as distinguished from many of the eczematous changes in the nail which spring from the root. In this initial stage, the margin of one or more nails near the free border loses its natural hue; the edge of the plate is visibly loosened from its attachments; and a thin, granular mass interposes between the damaged portion of the nail and its bed. The plate at this point being friable may either remain in place by reason of its attachment to the sound portion or it may break away. Patients usually pare off this portion before it is presented for examination. The process slowly advances upward to the root of the nail on one or both sides. As a rule the nails attacked seem to be indiscriminately selected; in other cases, however, there is symmetrical involvement of all the nails of both hands and feet.

In what has been termed the "pure type" of psoriasis of the nails (*Consumption dartreuse*, of Alibert; *psoriasis punctata unguium*) the process is less common and rather more conformable to that observed in tegumentary lesions. Multiple, pin-head-sized, and smaller punctate lesions, often rather regularly disposed, represent points of softening of the nail-substance where after desquamation of the horny material, equally minute sunken depressions are left in the plate, a condition which has been likened to the exterior surface of a thimble. When the process is both exaggerated and diffused, a deep transverse furrow, or groove, spreads across the plate which on either side of this *rainure* may be normal.

In many cases of psoriasis the changes when well advanced are difficult to classify, the picture presented being that of numerous lesions due to malnutrition and fracture. "Worm-eaten," pitted, friable, and discolored nails, some split, some fractured, may, on the digits either of hands or feet, leave a crumbling-edged, well-attached stump, the distal quarter or half the plate missing; the exposed matrix covered with an imperfectly formed horny epiderm.

In many cases where psoriasis affects the nails there is well-marked sub-ungual keratoma which may proceed to the point of partially detaching the nail from the bed, though the former is not often

actually shed. In exceptionally severe cases, the nails are greatly thickened, distorted, dislocated, or destroyed.

Other dermatoses, in which the nails are secondarily affected usually as complications only of the original process, are the several forms of pemphigus, dermatitis herpetiformis, epidermolysis bullosa hereditaria, pityriasis rubra pilaris, and pityriasis rubra. In most of these disorders the nail changes (thickening, thinning, discoloration, subungual hæmorrhage, loosening, and dehiscence) are resultants of the general disorder. In all type-cases of pityriasis rubra the nails are involved, being usually dislocated from the bed and often shed. In the early stages of the disease, the changes in color and nutrition of the nails are well marked.

Etiology and Pathology.—The chief causes of acquired diseases of the nails not parasitic in origin are: (*a*) Associated with general disorders of the economy—embarrassment of the circulation, central disorders of the nervous system, renal and other visceral affections, the fevers (exanthematous and other), the infectious granulomata (lepra, syphilis, tuberculosis), and malnutrition from whatever cause; (*b*) Associated with cutaneous diseases and those largely limited to the hands and feet—eczema, psoriasis, pityriasis rubra, traumatism, pressure, occupations involving immersion of hands or feet in water, and exposure of the latter to the action of chemical agents, heat, and cold.

The morbid process excited in most cases, whatever the cause, is inflammation of nail-walls, nail-folds, or the matrix, and a consequent small-celled infiltration with eventual hyperkeratinization or dekeratinization of the horny substance of the nail. Many of the resulting deformities such as crumbling, fracture, dislocation, or shedding, are due to secondary accidents occurring in weakened nail-substance. Leuconychia, whether due to traumatism admitting air to the nail-cells, or to failure of keratinization from another cause, is at times an achromia that is purely physiological. Unna believes that the admission of the air is rendered possible by weakness of the nail-cells.

Unna has ascribed many of the changes in the nail to mechanical compression, whereby a trough-like depression occurs in the nail-bed, high and narrow ridges resulting from the consequent proliferation of the prickle-layer, the nail-plate being thus freed from the bed below and forced to rise abruptly over the new-formed layer beneath. As all these changes have been observed where no compression had been exerted, the explanation is not wholly satisfactory.

Treatment.—The treatment of the diseases of the nail grouped above is often the same, whether the lesions be congenital, acquired, atrophic, hypertrophic, or traumatic. The indications are always, as far as practicable, to set aside the remote or immediate causes of the affection. In circulation embarrassments, the narcotico-stimulants

(tobacco, alcohol, tea, coffee) and the indiscriminate use of sweets should be abandoned; and in the gouty, overfeeding is harmful even with an appropriate dietary. In the anæmic and asthenic, ferruginous preparations, cod-liver oil, and tonics in general are indicated. The internal administration of arsenic advocated by some authors, should be advised only in exceptional cases, as the metal has been followed by keratomatous changes in the hands, feet, and nails.

In all circulation-embarrassments, the feet should be kept as dry as possible, stimulating alcoholic lotions being applied morning and night, *e. g.*,

R	Benzoin., tinct.,	3v;	20	
	Glycerin.,	3ijss;	10	
	Spts. vin. rect., }			
	Aq. ros., }	aa 3ij;	90	
Sig.	External use.			M.

The feet should then be carefully dried and a powder thoroughly dusted over and between the toes, *e. g.*,

R	Talc., (opt.) }	aa 3v;	20	
	Acid. boric., }			
	Acid. tannic.,	3ijss;	10	M.
Sig.	External use.			

Modifications of these applications may be employed as required also over the hands.

In all cases the toes and fingers need careful protection, and suitably adapted covering. Woolen and fleece-lined gloves are to be avoided. The operations of the manicure are to be omitted in many patients, with especial reference to the avoidance of leuconychia.

In many of the atrophic disorders of the nail, the nail-folds and soft parts adjacent require shampooing with the tincture of green soap, after which one of the simpler pomades may be applied (zinc-oxid; bismuth; lead oleate, etc.). In some cases it is well before applications are made to soak the digits in weak alkaline solutions (bicarbonate or baborate of sodium).

In surgical cases (ingrowing toe- and other nails, paronychia, enormous gryphosis, etc.) surgical treatment, even in cases removal of the nail, is necessary. Many of the milder cases of ingrowing nail may be relieved by thinning with a file the middle portions of the plate, lifting the ingrown edge away from the fissure or ulcer by insinuating a pledget of cotton beneath and between, and appropriate pencilling of the irritated portion of the nail-fold with a weak silver solution followed by diachylon salve.

Kinsman's method¹ ensures disinfection by hydrogen dioxide, after which a drop of a solution of cocaine is applied followed by Monsel's solution which produces retraction of tissue. A dressing of gauze is applied over all and the application renewed every second

¹ Hardaway, l. c.

day. Pürckhauer scrapes away the nail-tissue softened in a forty per cent. caustic potash solution, repeated as required until the softened plate can be lifted away from the ulcer and excised.

The treatment for all conditions of the nail associated with dermatoses of the neighboring parts, is that of the affected skin. The various lotions and unguents employed in eczema, psoriasis, etc., are usually applicable to the nails. Ichthyol in pomade and lotions (preferably the latter) in the strength of 25 to 50 per cent.; 2 to 5 per cent. solutions of argyrol or silver nitrate; white precipitate salves ten to fifteen grains (one-half to one gram) to the ounce (30.) of equal parts of cold cream and vaseline—are all of approved value. Dubreuilh advises in these cases an application of two parts of chrysarobin and one-half of resorcin, to ten each of lanoline and lard.

The wearing of rubber gloves and cots is of use in all cases where protection of the nails is demanded.

ONYCHOMYCOSIS.

(Gr., *ὄνυξ*, nail, and *μυκή*, mushroom.)

The diseases of the nails due to invasion by vegetable parasites are much less frequent than cutaneous affections of similar origin. It is, however, accepted that this group of diseases is much more common than is generally believed. A single nail of one hand or foot, not rarely several, have exhibited morbid symptoms year after

FIG. 204.



Tinea trichophytina unguis. (HOWARD FOX.)

year, and only at the last moment the exact nature of the change has been recognized. It is undetermined whether ringworm or favus of the nails is more common in this country.

Onychomycosis Trichophytina.—(*Tinea trichophytina unguis*; ringworm of the nails. Fr., *Onychomycose*; Ger., *Schimmelpilzmykosen der Nägel*.) Ringworm of the nails is an affection of extreme rarity. The effective parasite is most often the trichophyton megalosporon ectothrix (Sabouraud), derived from the animal kingdom, though transferable also from man to man. There may be coincident ringworm of the body or the parasite may attack one nail only, or several. After invasion of the organ, the plate becomes changed in color, consistency, and shape, the process beginning commonly in the anterior border of the lateral fold. After infection of the nail-bed and matrix the nail becomes friable and breaks away irregularly from its attachments; there is often subungual debris of cells; and the hyphomycetic invasion extends in longitudinal striæ toward the lunula. In other cases, puncta, split and furrowed spaces, dull-whitish, yellowish, brownish, and even blackish in hue, form at first deeply, later superficially; and finally the anterior portion of the plate is cast and a stump is left *in situ* near the lunula. Onychia and onychogryphosis may result. There may or may not be coincident ringworm of the skin.¹

Onychomycosis Favosa.—(*Tinea favosa unguium*; *Favus* of the nails. Fr., *Onychomycose favique*, *Favus des ongles*.) In favus of the nails the effective parasite is the achorion of Schoenlein, usually implanted on the nails by auto-infection from scutella.

According to Unna the rarity of involvement of the nail-plate (as distinguished from the trichophytic nail) is due to surface-catarrh of the nail-bed. The nails become yellowish in hue; subungual masses of cells form though no true scutella; a dry, dirty-whitish powder, constituted of scales, forming both beneath the free border and beneath the attached plate. The latter is often raised from its bed by the fungus multiplying in anaërobiosis, limiting its invasion largely to the subungual parts. Long parallel lines of fungous growth may occasionally be recognized running beneath the plate in the prickle-layer, which may be raised, split, and thickened by the morbid process. Unna found the papillæ generally thickened.

Treatment.—In the treatment of both trichophytosis and favus of the nails, it is first necessary to remove as far as may be the horny substance which interferes with the penetration of a parasiticide. The plate should be first scraped and then anointed with some substance having power of penetration such as the mercuric oleates, ten to twenty per cent. or stronger; bi-chloride of mercury solutions; olive oil and pyrogallic acid equal parts (Dubreuilh); solutions of iodine and iodide of potassium, fifteen grains (one gram) of the first, to half a drachm (two grams) of the second, dissolved in a litre of distilled water (Sabouraud). Leistikow (quoted by Hardaway) advises:

R	Pyrogallol.,	5i;	4
	Naphthol.,	5ss;	2
	Hydrarg. ammon.,	gr. xv;	1
	Guaiaei tinct.,	3vijss;	30 M.

¹ Cf. Ravogli, J. A. M. A., 1907, July 27, p. 308, with four illustrations.

Harrison after scraping the nail, applies on lint one part of the iodide of potassium in four each of liquor potassæ and distilled water, for fifteen minutes, after which a one per cent. solution of the bichloride of mercury in equal parts of spirit and water is kept in contact with the part for twenty-four hours. This method is advocated by Radcliffe-Crocker. Sulphurous acid freshly opened or an aqueous solution of the hyposulphite of sodium one part to six or ten mopped over the nail after application of dilute acetic acid, are often effective.

AFFECTIONS OF THE NAILS DUE TO SYPHILIS.

Changes due to Hereditary Syphilis.—In congenital lues the nails are less often affected than in the acquired forms of the disease. In both the process may assume the onychia type. In the former the resulting onychia is often a part of a specific dactylitis, the earliest lesion being a papulo-pustule at the margin of the nail, which bursts and leaves an ulcer extending to the matrix and surrounding soft parts. The phalanx on which the nail is implanted is the seat of a painful osteitis, becomes club-shaped, and the ulcer when fully formed presents the characteristics of specific tissue-loss in general, with everted edges, sloughy floor, and indolent infiltration of the skin in the vicinity. In other cases a chronic inflammatory process affects the soft parts about the nail, and the plate undergoes consequent changes, losing its polish and becoming dirty-yellowish in hue, thickened, friable, and furrowed.

In Vajda's case, cited by Shoemaker, a speckled appearance of the nail first appeared, due to splitting of the young nail-substance into undulating lamellæ, a "wavy arrangement of the nail-cells" corresponding. There was enormous massive thickening of the nail associated with hypertrophy of the papillæ of the bed.

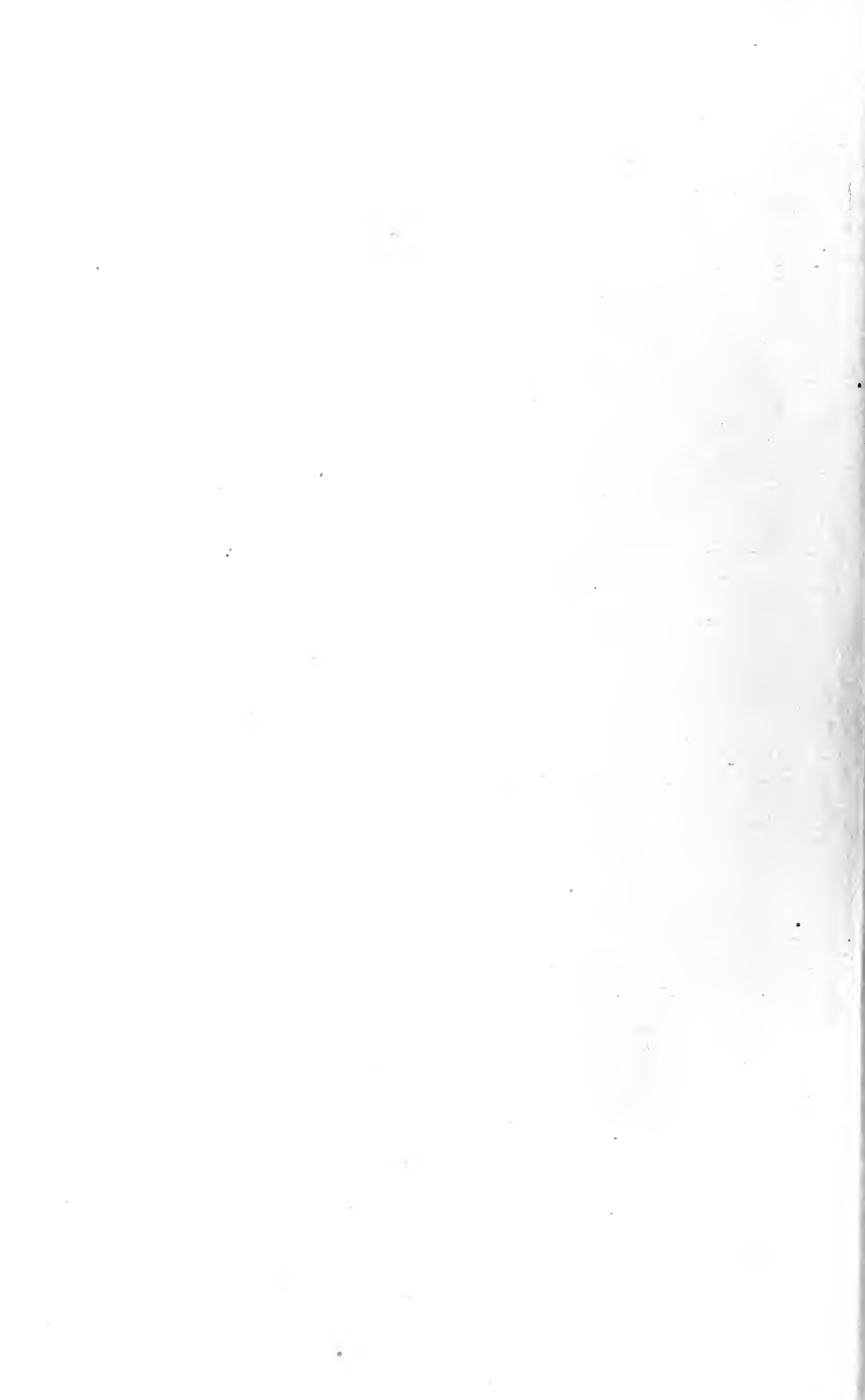
Changes due to Acquired Syphilis.—**Chancres.**—Digital chancres most often occur in persons whose vocation requires handling of the infected; we have had under observation one case in which a finger was inoculated during a blow on the mouth of an infected antagonist. Chancres of the finger are often seated in the nail-folds, partly in consequence of the frequency of hang-nails in that region, partly because of the exposures incidental to the use of the digits.

The chancre is usually single and begins as an indolent painless nodule involving the nail-fold, developing into a distinctly indurated, circumscribed, dull-reddish, exuberant mass. The tumor-like projection usually ulcerates superficially; though not many cases are observed where there is uninterrupted evolution of the lesion, as the surgeons, midwives, and others commonly infected, have usually cauterized, excised, or otherwise treated the sore. Some of them suffer simultaneously from sepsis, and aside from the accompanying epitrochlear and axillary adenopathy, develop febrile temperatures, have axillary abscesses, and suffer greatly in health before the syphilitic process is distinctly recognized.

PLATE LIV



Syphilis of the Nails.



In yet other cases a wide margined, florid, and exuberantly granulating fungous mass springs from the nail-fold, capped with a sanguineous ulcer the nature of which is long unsuspected.

Syphilis of the Nail-plate (*Syphilonychia sicca*; *Friable onychia*; *Scabrities unguium syphilitica*. Fr., *Onyxis craquelé*).

In this condition the plate may be attacked in whole or in part, and in the latter event with definite contour of the involved area. The distal portion is commonly first involved, the horny plate losing its polish, becoming dull-reddish or yellowish-white in color, friable, cracked, thickened, roughened, and fissured. The nail-folds may be secondarily infiltrated and scaling. In some cases the nails are considerably thickened; in others, pin-head-sized, necrotic, sharply defined points open to the matrix—the condition strongly resembling the similar change seen in psoriasis. One or several of the plates may be shed in a painless process, though prompt amelioration may occur under treatment.

Syphilis of the Nail-bed and Matrix (*Paronychia syphilitica ulcerosa*).—The paronychia due to syphilis is the more frequent of the nail-symptoms of that disease; and may first attack the nail-wall or fold which then becomes dull-reddish in hue, infiltrated, and scaling.

FIG. 205.



Onychia and paronychia occurring in conjunction with a generalized pustular syphiloderm.

After persistence the plate begins to show the changes seen when the latter is primarily attacked. The process is indolent and may terminate before ulceration sets in, under appropriate therapy.

In other cases a papule, pustule, or an infiltrated and indurated

nail-wall, breaks down with ulcer-formation, attacking the border of the nail and extending beneath the plate, which undergoes the secondary changes already described. In severe cases the nail after turning a greenish-black hue is dislocated to one side or shed, and the entire matrix becomes the seat of an extensive and spreading ulcer. The phalanx becomes swollen, clubbed, and painful; and abortive attempts at new nail-formation may be recognized. Taylor describes a rapid necrosis beginning with a brilliant, diffuse redness of the entire phalanx in which the nails are destroyed "as if struck by a blight," resulting in grave ulceration with lymphangitis and adenopathy, the entire fore-arm becoming reddened and swollen due to a sequestrum of the embedded portion of the dead nail.

Treatment.—Energetic treatment of the systemic condition is required in all luetic diseases of the nails. The special mode of such treatment depends as a rule upon the time which has elapsed since infection; but the existence of a well-marked nail-lesion of undoubted syphilitic character should always point to the urgent need of remedies directed to the correction of the toxic disorder. As a rule most of the diseases of the nail due to syphilis are both chronic in course and rebellious under even energetic remedies.

In most of the dry and non-ulcerative affections shampooing of the nails should be practiced daily. Where scraping or filing of the nails is required for the purpose of removing crumbling tissue, a previous soaking in liquor potassæ, fifty per cent. solution, in distilled water, may be required. At night a pomade should be applied containing mercurial ointment, one part to two or three of lanoline oil, kept in place by a cot worn during the hours of sleep. For this may be substituted white precipitate one part to fifteen or thirty of cold cream salve. The sulphur salves in ten per cent. strength with the red sulphuret of mercury added in the strength of ten decigrammes to thirty of salve basis, are often efficient.

In ulcerating nail disorders the treatment of the attacked parts is very largely that of ulcerations elsewhere. The strong caustics once advocated are now much less frequently applied. Soaking in bichloride of mercury solutions, one to one thousand is preferable; and when granulations are present, pencillings with a ten per cent. or stronger solution of argyrol or silver nitrate. Often a saturated solution of pyoktanin blue in distilled water may be advantageously painted over the ulcer which after it is dried is dusted with euophen or iodoform.

CLASS X.

DISEASES OF THE TROPICS AND WARM COUNTRIES EXHIBITING CUTANEOUS LESIONS.¹

The diseases exhibiting cutaneous lesions which occur as well in warm climates as in the tropics, are here considered in a separate group, chiefly for the convenience of the reader. These affections are attracting the special interest of American physicians apart from their pathological features, first, because they occur to such an extent in the colonial possessions of the United States lying within the tropics; and second, because in several of the states of the union, climatic conditions, especially in the summer season, are those of tropical countries.

HYPERÆMIC AND INFLAMMATORY DISORDERS.

LICHEN TROPICUS.

(MILIARIA, "HEAT RASH," PRICKLY HEAT, ECZEMA SOLARE, RED GUM, STROPHULUS; *Fr.*, MILIAIRE; *Ger.*, SCHWEISSFLECHTE.)

In tropical and warm countries under the influence of high degrees of temperature, the skin may become the seat of a mild and in some cases quite severe disorder which primarily originates in hyperæmia of the sweat glands. It occurs commonly in those who have been sweating profusely and particularly in persons having a sensitive skin, such as infants and young adults, invalids, the gouty, and the obese. The lesions are usually pin-point to pin-head sized discrete but closely aggregated, vesicles, vesico-papules, or distinctly pure papules. The sensations are those of pricking, burning, and itching; hence the disorder has acquired one of its popular names, "prickly heat."

"Prickly heat" may affect the entire body surface but is commonly most displayed in the parts covered by clothing which are the seat of excessive sweating. In tropical countries the morbid condition is aggravated in persons of obese habit of body and in those who, coming

¹ Recent Literature of Tropical Diseases: Scheube, Faleke and Cantlie, *Dis. of Warm Countries*, Phila., 1903; Manson, *Tropical Dis.*, 4th ed., 1907, with 7 plates and 241 cuts; Jackson, *Tropical Dis.*, Philadelphia, 1907; Ashford and King, *J. A. M. A.*, 1907, xlix., p. 471; Radcliffe-Crocker, VI. *Internat. Derm. Congress*; *J. C. D.*, 1908, xxvi., p. 49; Rixey, *ibid.*, p. 63; Fox, Howard, *ibid.* (*Skin Diseases of the Negro*), p. 67.

from other countries are not habituated to the heat of the climate, and who in the effort to counteract its debilitating influences, resort to the use of alcoholic stimulants.

The disease in the heated season of the northern climate is usually scarcely more than an annoyance; but occurring in the tropics it may induce a severe inflammatory process in the skin progressing to grades of an acute dermatitis, with pustulation when the lesions are infected with cocci.

Etiology and Pathology.—Overheating of the body (from climatic effects, high temperature of rooms, excessive use of alcoholic beverages, sweating under the influence of opium, aspirin, or another sudorific) is the usual cause of the disease, resulting in hyperæmia of the parts about the sweat gland and pore. The question whether the process is strictly limited to the epiderm, to dilatation of the excretory ducts of the sweat glands, or to the irritation produced by the sweat on the surface is not definitely settled. That sudation is an essential part of the process is demonstrated in every well marked case.

Diagnosis.—The temperature to which the skin has been subjected; the sweating, local or generalized; the character of the lesions; and their close agglomeration, all point to the nature of the malady. In papular eczema there are usually patches and a serous exudate which stiffens linen, as distinguished from sweat-moistened clothing, which exhibits no such peculiarity. Vesicular eczema rarely exhibits uniformity and symmetry of the resulting lesions.

Treatment.—The indications are to remove the cause, as far as practicable, and to soothe the irritated skin. Lotions and powders are preferable to ointments. The parts may be washed or wiped with starch water, almond-meal water, or bran water, and then dried and thoroughly dusted with a soothing powder, as equal parts of boric acid, zinc-oxid, and starch. The use of soap should be interdicted. The bowels should be regularly evacuated, and acidulated beverages, never iced, may be ingested in moderate quantity. When medicated lotions are indicated, one may use the zinc-oxide and lime water combinations which are useful in the treatment of acute eczema. One may also employ with advantage black wash diluted one-half with water; weak lotions of carbolic acid, one part to two hundred and fifty, of alcohol and water; or of the biborate of sodium, one part to two hundred. When a dusting powder is used talcum, the stearate of zinc, or acetanilide, one part to thirty each of boric acid and talcum, may be employed with advantage.

PEMPHIGUS CONTAGIOSUS OF THE TROPICS.

Under this title, Manson, Jackson, and Singh (cited by Manson), have described a disorder, non-febrile in character, peculiar to warm countries which is here assigned a provisional position in the list of tropical diseases. It is admittedly highly contagious, but though the

Leishman body has been found in its blebs, no special bacterium has been demonstrated as efficient in its production.

The disease exists in Cuba and the Philippines, in the Straits Settlements, Madras, Queensland, Japan, and other lands.

Pemphigus contagiosus is apparently a variant from the *impetigo contagiosa* of temperate countries. The lesions are at the outset erythematous puncta, developing into vesicles and smaller and larger blebs, moderately pruritic, the last springing from a sound skin, tense, shining, and with pellucid contents. The serous exudate soon becomes turbid and is confined in a bulla which, after becoming flaccid, spontaneously or after trauma bursts, the morbid process advancing eccentrically with epidermal exfoliation until an area an inch or more in diameter is involved. When self-limited, a pinkish, somewhat glazed patch becomes visible covered with a scale resembling tissue-paper. At times vesiculation proceeds at the periphery of the invaded area. The lesions may be relatively few or, more often, numerous.

All parts of the body may be attacked but especially the axillary regions and fork of the thighs (*eczema intertrigo*), where in hot weather the distress may be considerable, the skin becoming raw, tender, and the seat of secondary infections as shown by the occurrence of boils. In some of Singh's cases a slough formed.

Etiology and Pathology.—*Streptococci* and *staphylococci* are obviously responsible for the disease.

Windisch,¹ in describing his experience with contagious pemphigus of the tropics developing among the troops of the United States during the late Spanish war, clearly identifies the disorder as contagious impetigo, reporting accidents of infection by the medium of clothing, towels, etc., and by intentional inoculation of the secretions of the vesico-pustules developing in the disease. Sichel, on the other hand, describes several forms of the disorder, two following attacks of lichen tropicus ("prickly heat"), one markedly pustular in type, the lesions developing in groups, contagion and auto-inoculation not being distinctive features of the disorder. In some instances boils were present—all the patients had been freely sweating. Munro,² has cultivated what he considers a specific micrococcus (*micrococcus vesicans*) from the contents of lesions in the same disease. His descriptions agree with those of Manson and Windisch, and yet he believes the disorder to be different from *impetigo contagiosa* because of the absence of febrile symptoms which is a point unfavorable to his argument; and also because the lesions occur more frequently on the limbs than on the face. The few fatal cases reported by tropical surgeons are evidently results of other toxic agencies such as drink, filth, and exhaustion.

Diagnosis.—*Pemphigus contagiosus* is distinguished from vari-

¹ J. A. M. A., 1900, Jan. 13, p. 77.

² Brit. Med. Jour., April 29, 1899, p. 1021.

cella by the absence of febrile symptoms. The microscope excludes mycotic germs.

Treatment is by strict cleanliness, and the use of bichloride lotions (one to one thousand in water) followed by the application of dusting powders.

FEBRILE DISORDERS.

ACRODYNIA.¹

(Gr., *ἄκρος*, extremity.)

(DENGUE FEVER, ERYTHEMA EPIDEMICUM, CHEIROPOETALGIA, RHEUMATISMUS FEBRILIS EXANTHEMATOSUS, RHEUMATISMUS FEBRILIS EPIDEMICUS, ARTHRODYNIA, BOQUET, BOU-BOU, KNOCK-ELKOORKS, PLANTARIA.)

Acrodynia is an acute, infectious, epidemic disease accompanied by articular and muscular pains, digestive disorders, and by the exhibition of eruptive symptoms, the affection occurring for the most part along the coast-line of warm countries, more particularly in the southern parts of Europe and America, including the West Indies, in Asia and Africa, and also in the Philippine and Hawaiian Islands.

Symptoms.—There is commonly a prodromal period lasting from a few hours to two days, characterized by twinges in the joints, by gastro-intestinal and nervous symptoms, by general depression, and by a feeling of malaise.

Often, however, the disease begins with suddenly occurring chills followed by febrile temperatures (103°–106° F.), remittent rather than intermittent in type, by headache, accelerated pulse, and characteristic pains in the larger and smaller articulations, especially in the knee-joints, the muscles at the same time being often exquisitely tender and the seat of pain. The popular name, “dandy fever” (dengue), is supposed to be derived from the oddity in the gait of sufferers from the disorder.

The *Initial Rashes* of the disease are of the order of the toxic erythemas (maculations of the surface due to vasomotor disturbance) most conspicuous in the facial region and lasting only for from one to five or six hours. At the same time the eyelids become puffy; and there may be coincident lachrymation, photophobia, secretion from the nares blocking at times the external orifices, injection of the conjunctival and pharyngeal membranes, and dysphagia due to tumefaction of the tonsils.

¹ Bibliography: Manson, *Tropical Diseases*, London, 1900, p. 195; Scheube, Falcke, and Cantlie, *Diseases of Warm Countries*, Philadelphia, 1903, p. 38; Brun, *Bull. de l'Acad. de Méd.*, 1893, xxx., p. 227; Davidson, *Hygiene and Diseases of Warm Countries*, 1893, p. 323; von Dühring, *Monatshefte*, 1890, x., pp. 16 and 128; Forrest, *Amer. Jour. Med. Sci.*, 1891, lxxxi., p. 329; Hirsch, *Handbuch der hist. geog. Pathologie*, 1881; Leichtenstein, *Nothnagel's Specielle Pathologie u. Therapie*, Wien, 1896, iv., p. 197; Jaquet, *La Prat. Derm.*, i., 1900, p. 261; Bodros, *Réc. d. mém. de Méd., Chir. et Phar. milit.*, xxxi., s. iii., 1875, p. 428 (describing an epidemic); Ollivier, *Bull. de l'Acad. de Méd.*, 1888, p. 617; Alibert, 2d ed., Paris, 1833; Unna, *Realencyclop. d. ges. Heilk.*, 4 Aufl., abstr. *Monatsh.*, 1908, xlv., p. 518.

With these symptoms there may be severe or slight salivation, a coated tongue, jaundice, albuminuria, insomnia, and other signs of grave systemic disturbance.

Defervescence commonly occurs about the fourth day, the symptoms then rapidly losing their severity and distinctive features.

Terminal Exanthem—the so-called secondary eruption of the malady—though in some cases absent, occurs usually between the third and sixth day of the disease, with or without further pyrexia symptoms, with evolution of macules, though there may be vesicles, blebs, pustules, or wheals, chiefly over the face, hands, forearms, thighs, and chest, though it may be both symmetrical and universal. The commonest form of the exanthem is that in which isolated, slightly raised, dull-reddish, pea-sized spots appear which may coalesce and later become purplish-brown in hue. Manson states that where there is marked coalescence, the islands of sound skin produce, at first sight, the impression that they constitute the eruption, a species of pallid exanthem on a scarlet ground. The lesions have been described as resembling those occurring in measles, scarlatina, urticaria, roseola, lichen, etc. The palms and soles are oftener of a brilliantly vivid hue. The subjective sensations awakened are pricking and burning. Simultaneously, there is adenopathy of the cervical, axillary, and inguinal glands usually temporary in duration. The exanthem may endure for a few hours only or for several days, and may recur after complete or partial disappearance.

Desquamation, slight and furfuraceous, occasionally with shedding of large flakes, may follow during from two to three weeks and be accompanied by severe pruritus.

The subsequent course of the disease is toward a convalescence often interrupted by severe recurrences of pain in one or more joints or muscles. Beside the adenopathy named above, there may be profound physical prostration, furunculosis, orchitis, albuminuria, and cardiac complications.

Etiology and Pathology.—Dengue belongs to the category of the exanthemata in general, the essential factors in which have been recognized so rarely. "Mobile granules" have been found by Hunt in blood freshly removed from patients: also in bouillon infected with their breath. The disease is contagious; is transmitted most often to individuals living on the coast-lines by the medium of ships and travellers; is relatively rapid in its spread; and is one communicable to attendants and physicians. The virus of the disease is believed to be capable of transmission through the medium of the soil and the clothing. It is favored by high atmospheric temperatures, but conditions of sex, race, age, and occupation seem to be of no etiological importance.

In four post-mortem examinations of the dead made by Nogué, there were lesions of the lungs and of the brain (meningitis with adhesions, and sero-purulent infiltration of the pia mater). Chomel and Ratmier believe that the disease is due to such changes in the cer-

eal foods consumed, as have been alleged efficient in the production of pellagra both in this country and in Italy. Certainly in all well-marked cases the diagnosis when practicable is to be made, between the two diseases named and grave ergotism. It may be doubted whether the lines of distinction between these several morbid conditions can be carefully drawn.

Diagnosis.—The affections with which the disease is most liable to be confounded are the exanthemata. The characteristic muscular and articular pains of dengue, occurring both during and after the attack, with the special peculiarities of the exanthem, must be relied upon for a recognition of the disease.

Erythema multiforme is less often accompanied by fever and pain.

Treatment.—As the affection is one which accomplishes a cycle of evolution and involution, the treatment is that indicated by the general condition of each patient, including a light diet, rest, the antipyretics, and opiates when needed for relief of the pain. The eruptive symptoms are to be treated, if at all, by emollient baths, and soothing dusting powders.

Prognosis.—The prognosis is in general favorable, the very young and old offering the most unfavorable chances of recovery.

PARASITIC DISEASES OF ANIMAL ORIGIN.

ANKYLOSTOMIASIS.¹

(Gr., ἀγκύλος, a bundle; στόμα, mouth.)

(UNCINARIASIS; HOOK-WORM DISEASE; DOCHMIOSIS; TROPICAL CHLOROSIS; DIRT-EATER'S ANÆMIA; MOUNTAIN ANÆMIA; "GROUND-ITCH.")

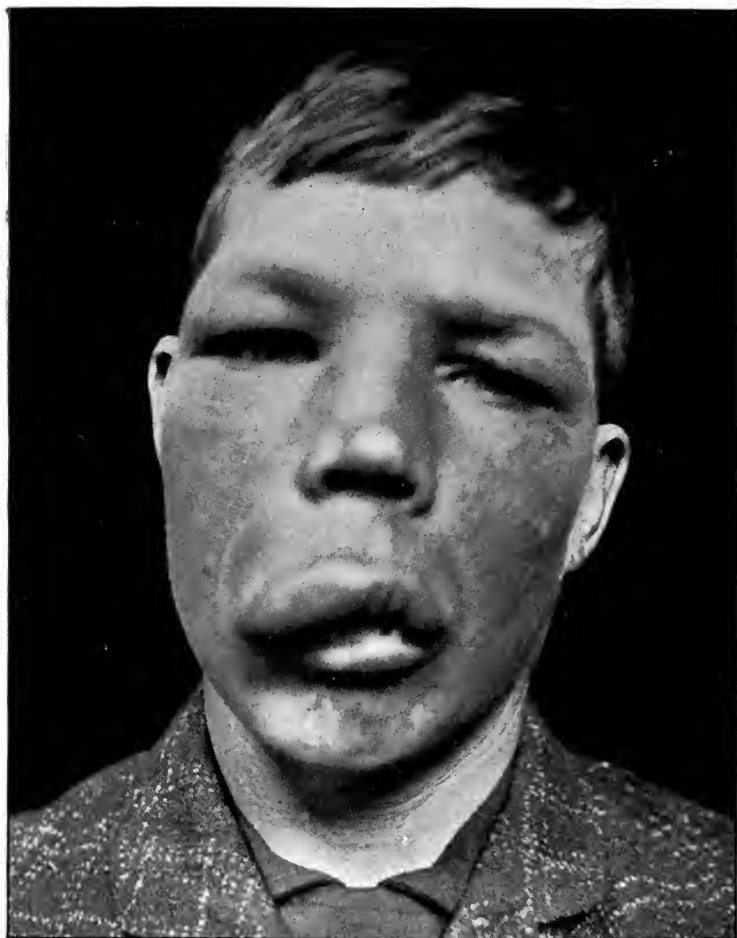
The disease has been recognized in Egypt, southern Europe, Japan, Australia, the East Indies, Ceylon, South America, and elsewhere; but has attracted special attention in consequence of its prevalence in the United States and to some extent in Porto Rico, where about 30,000 patients have been treated, and in the Philippine Islands. It is believed that annually thousands acquire the disease in the United States especially in Virginia, North and South Carolina, Georgia, Florida, Alabama, Louisiana, Texas, Mississippi, Missouri, and Tennessee.

Ankylostomiasis is a progressive anæmia occurring in man after invasion of the intestinal canal by a blood-sucking parasite, the *Necator americanus* (*Ankylostomum americanum*; *Ankylostomum duodenale*; "hook-worm").

¹ Ashford and King, J. M. A., 1907, Aug. 10, p. 471. Smith, C. A., J. M. A., 1906, Nov. 24, p. 1693 (3 illustrations). Über die Loossche Lehre, betreffend die Einwanderung der Ankylostoma-Larven durch die Haut, Tenholt-Bochum, Zeitschr. f. Medizinbeamte, 1905, Nr. 4, abstr. Monatsh., 1905, xli., p. 409. Über den neuen Infektionsweg der Ankylostomalärve durch die Haut, Schöffner-Deli-Sumatra, Centralbl. f. Bakteriologie, u.s.w., Bd. 40, Heft 5, abstr. Monatsh., 1907, xlv., p. 393. Über das Vorkommen des Ankylostoma in der Haut, Dubreuilh-Bordeaux, La presse méd., 1905, Nr. 30, abstr. Monatsh., 1905, xli., p. 409.



PLATE LV



Elephantiasis Telangiectodes of the Upper Lip and Portions
of the Face.

This parasite has two pairs of ventral labia and one dorsal pair with a tooth which has given the name to the worm. Access to the human body, as determined by Looss, in 1894, is obtained rarely through the digestive canal; in 96 per cent. of patients through the skin, chiefly through the cutaneous follicles. Schaudinn has confirmed the observations of Looss by the production of ankylostomiasis in monkeys, after spreading a watery suspension of ankylostoma duodenale over the shoulder-blades.¹ Properly shod individuals almost never contract the disease. After penetration of the body a long train of systemic symptoms may be induced, including not only the characteristic anæmia but also grave disorders referable to the digestive, circulatory, and nervous systems, in both acute and chronic manifestations, death resulting in severe attacks of the malady.

The cutaneous symptoms occur in from a few minutes to half an hour after exposure to the encysted larvæ, beginning with pruritus followed by redness, tumefaction, papulation, and vesiculation. In favorable cases there is no pustulation, but after extensive invasion, pustules and even rebellious ulcerations develop. The lower extremities which are often swollen, may exhibit extensive scarring after healing occurs. The diagnosis depends largely upon discovery of worms or ova in the stools; and the treatment is chiefly by anthelmintics including male fern, thymol, beta-naphthol, and oil of eucalyptus.

FILARIASIS.

(Lat., *filium*, a thread.)

(ELEPHANTIASIS ARABUM, PACHYDERMIA, BUCNEMIA TROPICA, ELEPHANT LEG, BARBADOES LEG, COCHIN-LEG, SPARGOSIS FIBRO-AREOLARIS; HYPERSARCOSIS; SARCOMA MUCOSUM. *Fr.*, MAL DE CAYENNE.)

Filariasis is a disorder largely of tropical countries as a consequence of the invasion of the human body by the *filaria sanguinis hominis*, three different species having been determined to be the effective agents in the production of the morbid phenomena, viz., the *filaria sanguinis hominis diurna*, *nocturna*, and *perstans*. These varieties of the nematode worm are thus differently named from variations in their periodicity and constancy of occurrence, one ranging the blood chiefly at night; a second chiefly in the day-time; and a third more or less constantly at all hours. The invasion of the body in the modes described below may be followed in the subjects of filariasis by no morbid symptoms; in others, changes are induced of a serious character, chiefly by reason of obstruction of the lymphatic channels.

Symptoms.—As the lymphatic vessels may be obstructed by pathological changes where filaria are not present, and as the resulting symptoms may be similar if not identical, it is obvious that the clin-

¹ See also Castellani, Brit. Med. Jour., 1908, Feb. 29, p. 494.

ical features presented in these different cases (filarial fever, abscesses, hypertrophy of glands, of limbs, of genitalia, of mammae, and of other circumscribed portions of the skin) may be the same. In the pages which follow these symptoms, for convenience, are described in a single group.¹

A more or less circumscribed hypertrophy of the skin and underlying structures, may affect any portion of the body, but especially the lower extremities, the external genital organs of both sexes, the inguinal regions, and, more rarely, the upper extremities, mammary region, the buttocks, parts of the head (ears), and with rarity the tongue.

The disease is more common in the tropics² where it is usually of parasitic origin; but sporadic cases are of occurrence in all countries, and are not very rarely seen in portions of the United States.

The most frequent seat of elephantiasis is the lower extremity of one side, where the foot, the leg, or also the thigh of the same limb, may enlarge. The penis and scrotum of men, the labia and clitoris of women, the upper extremities, the face, the ear, and portions of the trunk likewise may become involved.

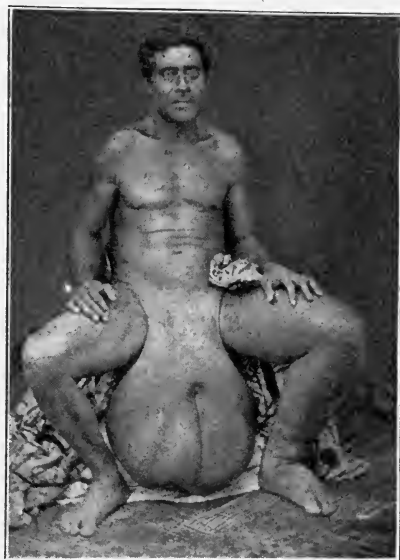
The disease is at times insidious in its approach, and generally chronic in its career, but may be ushered in with severe rigors, prostration, delirium, and fever. Usually, localized inflammations precede, as a cellulitis, an erysipelas, or a dermatitis, with or without involvement of the lymphatic vessels or glands. At the same time there is a condition of general fever (elephantoid or filarial fever), to which succeeds a defervescence, with abatement of the local inflammation, its sequels becoming manifested in a more or less persistent œdema of the part lately inflamed. After intervals of days, weeks, or months the pyrexia recurs with still greater involvement of the swollen tissues, which, with each access of fever, increase in volume and gain in density. When the elephantiasic condition is fully developed, the skin is tense, glossy, and blanched; or wart-covered, ichthyotic, pigmented in various shades; its follicles patulous, its glandular structures either hypertrophied or atrophied, its hairs thinned and roughened, the nails correspondingly changed (onychchauxis), with loss of lustre. Pressure upon the œdematous part is followed by slight pitting, but the tissue beneath is felt to be brawny and indurated. The parts beneath the skin are increased perceptibly in volume, especially the subcutaneous tissue; and the circumference of a limb thus diseased may be many times larger than that of its fellow. Lymphangitis is usually declared by painful, cord-like, linear indurations of the part, associated with adenopathy of the nearest

¹ Cases of non-filarial elephantiasis occurring in temperate latitudes have been reported by Bernstein and Price (following peritonitis), *Brit. Med. Jour.*, 1907, Mar. 16, p. 617; MacGregor, *ibid.*, 1898, p. 1597; Fowler, *Brooklyn Med. Journ.*, 1897, Feb.; Lake, *Chicago Med. Record*, 1905, Dec.; Southam, *Brit. Med. Jour.*, 1902, May 3 (gigantic enlargement of right lower extremity, with illustration); Rogers, *Med. Record*, 1900, July 28.

² Manson, *Brit. Med. Journ.*, 1894, June 2, p. 1186, with illustration.

ganglia. In older cases the skin loses its glabrous aspect, and exhibits eczematous, verrucous, papillomatous, seborrhoic, and even ichthyotic changes. Pigmentation even to a blackish tint, may ensue; scaling, fissuring, and furrowing are common; and the accumulation of altered sweat and sebum in these depressions is the source of an offen-

FIG. 206.



Elephantiasis scroti.

sive stench. During the course of the disease almost all the elementary lesions of the skin may be displayed: macules, vesicles, papules, tubercles, pustules, blebs, ulcers, crusts, scales, excoriations, and fissures. Warty growths form, as large as those seen in ichthyosis hystrix, and in some cases reddish-colored tumors spring from the hypertrophied integument.

When fully developed in the lower extremity, the unwieldy limb, increased threefold and more in bulk, with the foot, ankle, and leg massed into one huge, cumbrous cylinder, bears a striking resemblance to that of the elephant, from which circumstance the malady first received its name among the Arabs. Locomotion then is impeded greatly or is rendered impossible. Not less striking is the similar deformity of the genital labia of women or the scrotum of the male, the latter at times hanging below the knees even as far as the ankle (Fig. 206).

The penis disappears in rugous folds, and the urine passes along a gutter formed of skin transformed into quasi-mucous membrane. As a consequence of the fissures and excoriations which form, the lymphatic channels may be opened finally, and a true lymphorrhœa result.

Subjectively, the disease may be regarded as productive of less discomfort than would be suggested by its formidable features. Pain is experienced occasionally, and during the exacerbations accompanied by pyrexia there is corresponding malaise. The chief subjective sensations are those induced by weight and consequent tension, inseparable from the enormous masses of hypertrophied tissue.

In elephantiasis of the scrotum there are frequently symptoms of irritation, both systemic and in the vicinity of the affected part (nausea, vomiting, inguinal pain, and adenopathy, epididymitis, effusion into the sac of the tunica vaginalis, inflammatory swelling of the spermatic cord, and at times hernia). In some cases vascularization of the surface (telangiectatic elephantiasis) is a prominent feature. The form described below as *naevoid elephantiasis* may belong either to the same category, or to others in which there is lymphangiectasis ("lymph-tumors," "lymph-scrotum"), and these may be due either to lymphatic obstruction or to the parasite described later as of etiological importance in this connection.

Lymph-scrotum (*Varix Lymphaticus, Naevoid Elephantiasis*).—Lymph-scrotum may be the precursory stage of elephantiasis of the same part. Commonly an attack is announced by the occurrence of

FIG. 207.



Elephantiasis of the foot and leg.

fever, soon followed by erythematous redness of the scrotal envelope, followed by vesiculation and the development of blebs. The bursting of these is the source of the continuous drain which ensues. The scrotum becomes more or less enlarged, and though soft to the touch, is the seat of multiple, often numerous, lymphatic varices,

which on puncture or spontaneous rupture give exit to a rapidly coagulating lymph or chyle. Several ounces of a clear or lactescent fluid may escape in an hour, and the discharge persist to the point of producing grave physical exhaustion. Inguinal and femoral adenopathy may be present. Often there are recurrent chills, fever, erysipelas, abscesses, and the localized inflammations occurring in elephantiasis of other organs of the body.

Etiology.—The causes of elephantiasis as explained above are different in several of the disorders designated by that name. The most common factor, in the countries where elephantiasis is prevalent, is the presence in the body of *Filaria sanguinis hominis*, which can be recognized in the blood of the majority of natives of such countries. Living filariæ have been demonstrated in blood-vessels placed under the microscope.

The parasite is sought for best late in the evening, a drop of blood being transferred to the microscope-slide by the usual methods, the glass having previously been dipped in water, to each 30 c.c. of which have been added three drops of a saturated alcoholic solution of fuchsin. The embryo is recognized as a transparent, serpent-shaped, colorless organism exhibiting great activity by wriggling motions, which, however, do not greatly change the position of the worm. One extremity of the parasite is abruptly rounded; the other for about one-fifth of the entire length tapers to a fine point. The worm is enclosed in a delicate, limp, structureless sheath, or sac, longer than the contained worm. Manson believes that the function of this envelope is prevention of the puncture of the tissues of the animal in which it lives, prior to future development in an "intermediate host." Delicate transverse striæ can be recognized in the musculo-cutaneous layers of the entire length of the animal. A shining triangular V-shaped patch usually can be seen at a point about one-fifth of the entire length back of the head-end; and a similar but smaller spot is visible at a short distance from the end of the tail. These points are believed to be connected with the evolution of the embryo into the mature parasite. The head-end is capable of projection and withdrawal from a delicate prepuce having six lips, or hooks, a short thin fang being often shot out from the uncovered cephalic extremity.

The periodicity of filariæ is well marked in most cases under observation, the embryos swarming in the circulation at night and disappearing during the day, or the reverse. Manson estimates that at midnight there may be forty or fifty millions of embryos simultaneously circulating in the vessels, all of which may disappear by 8 or 9 o'clock in the morning, the hours of activity being reversed when the filarial subject habitually sleeps during the day and is awake at night.

The intermediate host of the filaria is the mosquito (the females of some family of the genus *Culex fatigans*), which after feasting on the blood of a filarial subject are found to have the stomach gorged with living embryos. The viscosity of the ingested dehydrated blood prompts the filariæ to struggle until freed from their sheaths, when

they begin a distinct locomotion for the first time in their life-history, —now entering the thoracic muscles of the insect, and here, as elsewhere in the body of the intermediate host, undergoing in a period of from ten to twenty days a metamorphosis resulting in the formation of a mouth, an alimentary canal, and a trilobed tail. A considerable increase is now noted in their size. The vast majority then pass forward through the prothorax and neck of the mosquito until they enter the head, where they lie coiled up close to the base of the proboscis, beneath the pharynx and under surface of the cephalic ganglia. The parasites may remain in this position until they have the opportunity of entering, by the attacks of the mosquito, into the body of a warm-blooded vertebrate host, refusing, as shown by experiments, to quit the mosquitoes which have been fed for long periods of time upon bananas.

Once reintroduced into the human body, sexual maturity is reached, fecundation ensues, and in due course generations of embryo filariæ are poured into the lymph. These passing through any intervening glands by way of the thoracic duct and the left subclavian vein, or by the lymphatics of the upper segment of the body, finally appear in the blood.

Other disturbances due to the same parasite, and only in part recognized as elephantiasis, are the lymph-serotum described above, chylous abscess, effusions, and vascular and hypertrophic enlargement of tissue and glands in and about tumors of the sort recognized as parasitic.

In other cases different causes are to be recognized. Predisposition of races or individuals, heredity, climatic influences, malaria, fatiguing labor with the feet and legs immersed in water, and filth in connection with "misery," have all been cited as favoring conditions. To these causes should be added the local disorders especially common in the lower extremities that have in cases proved to be points of departure of elephantiasis hypertrophy, such as obstruction to the blood or lymphatic currents by pressure of tumors, pregnancy, or neoplasms; ulcers; cicatrices; traumatism by pressure or friction; cutaneous diseases; systemic affections (syphilis, tuberculosis); and osseous disease.

Moncorvo¹ has described congenital elephantiasis after study of ten cases, in none of which were filaria recognized. All the infants had feeble resistance; and the parents of some were affected with either erysipelas, syphilis, or lymphatic obstruction.

Pathology.—Even macroscopically the elephantiasis mass is seen to be built up of hypertrophic elements representing all the tissues of which the part is composed. The knife with difficulty divides the homogeneous, whitish, and lardaceous mass, from which on pressure exudes a fluid of similar color. The subcutaneous connective tissue is found relatively much more enlarged and sclerosed than the epidermis and derma; though when section is made through the rugous and

¹ Sur la pathog. de l'éléphant. congénit., Paris, 1895.

warty skin described above, all the elements of the papillary layer, rete, and stratum corneum are seen to participate in the changes described in connection with the pathology of verruca. Here and there are loculi filled with fluid lymph. The sheaths of the blood-vessels, lymphatics, nerves, and the bones, muscles, and aponeuroses are also thickened, solidified, and occasionally agglutinated, so as to be almost indistinguishable in the mass of uniformly sclerosed tissue. The pigmentation of the derma is marked, the nuclei of the connective-tissue cells are multiplied, and the cutaneous glands intact, hypertrophied in their epithelial linings and investments, or, at a later stage, atrophied.

It is evident that in many cases, as Virchow has pointed out, the earliest of the changes to be noted occur in the lymphatic glands and vessels, the whitish and yellowish lymphatic fluid which then accumulates in the tissue resulting from obstruction of the lymph-channels. In some of the remarkable cases on record the lymphatic obstruction is the prominent feature of the disease, and the elephantiasic enlargement is subordinate in gravity to the former condition. Such are, for example, the noteworthy instances in which the lymph distends multiple cutaneous vesicles, after rupture of one or more of which the fluid streams away to a dangerous extent.

Diagnosis.—The striking deformity which characterizes elephantiasis will always suffice for its recognition. In the earliest stages of the disease, when there is merely oedema or an erysipelatous or eczematous condition of the skin, it would be difficult, if not impossible, to decide as to the future of the disorder, especially in a locality in which only sporadic cases occur. A symmetrical hypertrophy of both legs and both feet, developing in America, even though described as "elephantiasis," should carefully be studied before a diagnosis is made of the particular disease here considered. The same might be said of elephantiasis of but one inferior extremity. A patient with an extensive deforming induration and enlargement of the right leg and foot, accompanied by pigmentation and a well-marked warty condition of the skin, who had been pronounced the victim of idiopathic elephantiasis Arabum, had received a fracture of the upper third of both bones of the same leg during the previous year, and had since the accident constantly worn a tight bandage encircling the limb at the seat of the injury. The deformity rapidly disappeared under the application of a roller bandage extending from the toes upward.

A peculiar and rare, though characteristic, deformity of the labia majora of women—most commonly the labium majus of one side—results from a syphilitic, gummatous infiltration which must be distinguished from elephantiasis. In cases of this kind the history of the patient and the relative inferiority as to bulk of the affected organ point to the nature of the disease. The syphilitic labium rarely exceeds the size of a large fist.

A gigantic, hypertrophied mass of elephantiasic type is occasionally to be discovered in the lower extremity of only one side in pa-

tients who have been for many years the victims of an unrecognized and long-untreated syphilis. Even when the leg is many times its normal size and weight, and its contour lost in a thickened and roughened epidermis resembling the bark of a tree, the diagnosis may be made by discovering here and there in the depth of the mass circular and characteristic scars of healed gummatous ulcers.

Treatment.—Prophylaxis of filariasis is secured by elimination of the mosquito. In the early stage of elephantiasis the febrile condition of the patient and the localized cutaneous inflammation are to be treated by the measures appropriate for the relief of these conditions. Quinine, especially in malarial districts, is of the highest importance. When the elephantiasic development is established, if the genitals are involved the knife of the surgeon offers the best prospects. The result of such interference, both in the genitalia and the extremities, has in many cases been brilliant, though the mortality of such severe operations is necessarily great. When the lower extremity is involved it should be maintained in a horizontal position, its ulcers if possible be healed, its excrescences removed, its circumscribed inflammations resolved, and then elastic compression be carefully and skilfully maintained by means of a rubber bandage. The toes are first separately enveloped, then the foot and ankle, and lastly the leg. The results are sometimes highly satisfactory. Similarly the elephantiasic scrotum or labium majus requires support and constriction prior to operative interference.

Ligation and digital compression of the main artery supplying the elephantiasic leg have occasionally been followed by transient improvement. Instrumental compression has at times resulted in severe ulceration and a reawakening of the erysipelatous affection. Multiple punctures and incisions, made with a view to giving exit to the fluids contained in the mass, have been attended by no greater success. The main obstacle in all these surgical procedures is the lymphangitis which so frequently complicates the situation. None of them promises so well as nerve-stretching, which in a few isolated cases has been followed by noteworthy results. Excision of a portion of the sciatic nerve has also been followed by satisfactory changes. The use of the galvanic current has, when long continued, accomplished resolution of engorged masses of tissue. Elastic compression in the horizontal position for all cases not warranting nerve-stretching may be regarded as the wisest course when the extremity is involved. For the local treatment of the pachydermia proper, green soap, mercurial ointment, and bathing with hot or cold lotions may advantageously be employed. For patients whose disease is acquired in countries where the deformity is prevalent a change of climate is of the highest importance; and, having in view the social surroundings and habits of most victims of the disease, it is scarcely necessary to call attention to the need of a proper hygiene, diet, and tonic regimen.

Prognosis.—The future of a patient may be regarded as most favorable when the disease exhibits an early tendency to respond

favorably to appropriate treatment, and when circumstances permit of a resort to the best therapeutic measures which can be adopted, such as change of residence, persistent and careful dressing of the affected part, and the removal of any exciting cause of the disease, such as a neoplasm, an indurated cicatrix, etc. In the severer cases a fatal result may occur early in the disease; but usually life is prolonged, burdened by the inconvenience of the enormous elephantiasic mass, in comparison with which the rest of the body often seems to serve as a mere appendage.

TRYPANOSOMIASIS.

(Gr., τρύπανον, a borer; σωμα, the body.)

Human trypanosomiasis is an affection produced as a consequence of invasion of the body by the *Trypanosoma gambiense*, occurring chiefly in the western portions of Africa. The trypanosome is a flagellate blood parasite, about 15 to 30 microns in length and from 1.5 to 2 in width, which is believed to gain access to the system through the medium either of the tse-tse fly (*Glossina palpalis*) or a similar insect which may attack the skin. The mode of invasion, the life-history of the parasite, and other questions of importance in this connection have not been fully determined by laboratory research.

Symptoms.—The bite of the insect usually produces a point of local irritation, followed in the course of a few hours or days by the development of irregular and relapsing febrile phenomena. Physical and mental lassitude, headache, irritability of the heart, polyadenitis, and eventually marked anæmia result. Almost all writers agree that the cutaneous symptoms are rarely absent. These eruptive phenomena include papular and pustular lesions; and fugitive erythema evidently of toxic type, often occurs in circinate patches, some of which are from six inches to a foot in diameter, the margins fading very gradually into the surrounding normal skin. Stimulation of and pressure upon the integument produce vaso-motor distension of the cutaneous capillaries. In many cases there is marked œdema (skin of penis, abdominal surface, nucha, and face).

The terminal stages of the disease are those now well recognized under the title, **Sleeping Sickness**, for details of which the reader is referred to the standard treatises on the subject.¹ This stage of the disorder has thus far been followed by fatal results in an enormous majority of all cases.

Treatment.—Prophylaxis is to be sought by avoidance of the districts where the *glossina* is found; as also by protection from all insects.

Arsenic and mercury have been thought in some cases to be effectual.

¹ See Rogers, *Fevers in the Tropics*, London, 1908, p. 96.

DRACONTIASIS.¹(Gr., *δρακόντια*, serpents.)

(FILARIA MEDINENSIS; GUINEA-WORM DISEASE; DRACUNCULUS MEDINENSIS; MEDINA WORM; GUINEA WORM; FILARIA DRACUNCULUS. *Fr.*, DRAGONNEAU, VER DU KUTÉGAL; *Ger.*, PEITSCHENWURM; MEDINAWURM; *Holland.*, GUINEESCHE DRAAKE.)

The records of the guinea-worm disease extend to a remote antiquity. It is a disorder due to invasion of the body by a nematode parasite, the *Medina worm*, and occurs almost exclusively in tropical countries, more particularly along the West African Coast, in the Soudan, Egypt, and Abyssinia; in Asia, especially in the countries bordering on the Persian Gulf, in British India and the Fiji Islands; and in America particularly in Guiana, Brazil, and the Antilles.

Symptoms.—The lesions due to invasion of the skin by the *Dracunculus medinensis* are observed first at the point where the worm is about to make exit, which point may be at a considerable distance from that where it entered, and the exit may be made after an interval of several weeks or months. This approach to the surface for the purpose of securing exit is accomplished only when the worm is quite mature, at which time it can be felt beneath the surface, suggesting the presence of a soft cord. After some local sensation of tension or of itching, a pea-sized to small-nut or even egg-sized vesico-papule forms, superficial or subdermic in situation, which, after accidental or intentional rupture, gives exit to a clear serous fluid in which the uncolored head of the worm may be recognized. If the fluid be turbid, it is believed that the young embryos have escaped from the uterus. The head, which is surrounded by a quantity of leucocytes, appears either at once or in the course of a brief time, producing slow and sinuous movements by alternate contractions and elongations. The entire worm and its young may then wholly be extruded in the course of a week or more; or the head may be withdrawn and another swelling form at another part of the surface, the first meantime closing; or, in unskilfully managed cases, the worm may be torn so that the head only is removed, and then a severe lymphangitis with inflammatory, suppurative, and even gangrenous symptoms may supervene, producing, in fact, the train of symptoms now well recognized in connection with septicæmia. In some cases, however, the body may be discharged later than the head, after the mechanical separation of the latter, without serious consequences. The escape of embryos into the adjacent tissue is regarded also as a grave complication.

¹ Bibliography: Bloch, *Allg. med. Ctr.-Ztg.*, 1899, lxviii., p. 729; Foulkes, *Brit. Med. Jour.*, 1898, ii., p. 236; Fox, T., *Lancet*, 1879, i., p. 330; Harrington, *Brit. Med. Jour.*, 1899, i., p. 146; Mackenzie, *Ind. Med. Record*, 1898, p. 326; Manson, *Brit. Med. Jour.*, 1895, ii., p. 1350, and *Tropical Diseases*, 4th Ed., 1907, p. 667; Perrin, *Annales*, 1896, s. iii., vii., p. 131; Roux, *Traité prat. des Mal. des Pays Chauds*, 1888, iii., p. 553; Scheube, *Diseases of Warm Countries*, p. 379 (bibliography).

The chief sites of exit are the ankle and the foot—particularly the heel—but in rarer cases the leg, thigh, buttocks, penis, scrotum, hands, trunk, neck, and face may be selected. There is usually but one worm in a single subject of the disease, but the number may be indefinitely large in persons exposed.

Etiology.—The precise mode of invasion of the body by the effective parasite has not been determined, but it is probable that the larvæ of the worm or an intermediate host (the fresh-water cyclops) may be ingested in the drinking water, after which access is obtained to the mucous lining of the digestive tract; or that the skin may be either directly penetrated by the embryo or indirectly inoculated through the traumatism inflicted by such insects as the mosquito or the fly. The fact that nearly two-thirds of all cases occur in the foot is not without significance. Harrington observed the disease on the backs and loins of water-carriers where the leathern sacks come in contact with the body. Young filariæ have been seen penetrating the microscopic crustacea in fresh water, the later ingestion of which in drinking-water is supposed to be effective in the production of the disease.

Persons of both sexes and all ages are liable to be invaded; but the disease is of more frequent occurrence in the rainy season, and in male negroes and day laborers.

Pathology and Natural History of the Worm.—The female worm alone produces the disease. It is when mature a yellowish-white, cylindrical filament, gradually tapering toward the caudal extremity, averaging 60 to 80 centimetres in length and 0.5–1.7 in breadth, the body being extremely extensible by reason of the elasticity of its cutaneous envelope. The cephalic extremity is rounded and terminates in an oval, shield-like disk in which is a centrally placed triangular oral orifice. There is a small papilla on each dorsal and ventral edge and six smaller on the borders of the shield. While there is a straight intestinal tract extending through the body of the parasite, its bulk is composed of an enormous uterus which is capable of containing, according to estimates made, between eight and ten millions of embryos.

The embryos without decidua are flattish, possessing a long awl-shaped tail, a three-lipped mouth, and a digestive canal. They are capable of surviving for a week in water; and longer in moist earth or water polluted with material which provides them sustenance. Manson states that the embryos, when they have obtained access to the water, transfer themselves to the body-cavity of the *cyclops quadricornis*, fifteen or twenty at a time inhabiting the host, without apparent inconvenience to the latter. Soon the exuvium is shed for two or three times, the tails drop off, the worms acquire a cylindrical shape, and develop a tripartite arrangement of the caudal extremity.

In from ten to a maximum of fifteen months the maturity of the female which has been impregnated is attained, and the parasite finds

its way from muscles or other tissues in which she has been lodged or to which she has travelled to the surface of the body.

Diagnosis.—The diagnosis (to be made in countries where the disease is endemic) is based upon the discovery of the worm.

Treatment.—The usual method of treatment by the natives of the countries named is to secure carefully the head when it appears, and to tease out the worm very gently day after day until the entire body is extracted, securing the accessible portion by winding it about a bit of stick or of paper. Continuous irrigation of the wound is both recommended and practised where the disease is common. Tincture of *asafoetida* has also been employed to destroy the parasite.

Manson has protested against winding out the guinea-worm, stating that at best this process merely shortens by a few days the duration of the treatment in case the parasite is situated properly in the tissues without twists or turns, or if it has arrived at a stage of life when, having discharged its young, it is ready to come out spontaneously. If, as is often the case, the worm is twined and twisted among the tissues, and if she is still emitting her young, she will resist traction, a process which will result often in rupture. In consequence of rupture at this time myriads of young escape into the tissues, producing violent inflammation, which is accompanied frequently by secondary infection and possibly by sepsis. To determine if the worm is ready to come out spontaneously, the opening of the tumor may be douched for a number of minutes at a time, several times a day, by dripping cold water over it. When under the influence of this douching the worm no longer emits young careful winding out is not objectionable.

The accepted treatment is that devised by a French naval surgeon, Emily. The swelling produced by the worm when she approaches the skin and before she has pierced it, is injected in several places with a solution of mercuric chloride (1:1000). This kills the worm, which may be absorbed subsequently, or if cut down upon a day or two later her body can easily be withdrawn. In case the head of the worm be already protruding, the solution may be injected directly into her body, which is removed easily the following day. A number of cases have been treated successfully by this method, and with no disagreeable results in the way of pain or inflammation. This method also reduces the time of treatment from not less than four weeks to the much shorter period of four or five days.

Prophylaxis is secured by protection of drinking water from pollution and by wearing proper covering over the feet.

Prognosis.—The prognosis is favorable, save in cases in which septicemic symptoms develop as a consequence of coccogenous infection.

TICK FEVER.

(RELAPSING FEVER; SPIRILLUM FEVER; FAMINE FEVER; ROCKY MOUNTAIN SPOTTED FEVER; BLACK FEVER; BLUE DISEASE; PYROPLASMOSIS HOMINIS. *Fr., TIQUE.*)

Tick, or relapsing fever, is a disorder which under varying names has been recognized as of occurrence in all the great continents of the earth and especially in Iceland, the Scandinavian Peninsula, Russia, Africa, Turkey, China and the United States. (*Cf.* p. 443.)

Symptoms.—The disease, which attacks individuals of both sexes and all ages, begins with the usual prodromata of febrile accessions, chills followed by relatively high temperatures, delirium, icterus, and gastro-pulmonary symptoms. An initial pyrexia is followed by a first remission succeeded by one or several relapses, terminating fatally in about six per cent. of cases. In many patients there are cutaneous symptoms developing between the sixth and seventh days, more marked in certain epidemics than in others, consisting of labial herpes, accompanied by circinate rose-tinted maculations, one to five millimeters in diameter, developing at the surface of the trunk and extremities. Occasionally the mucous membranes are involved. At first the lesions disappear under pressure; later, they furnish a bluish purple marking of the integument. These are followed in three weeks by desquamation.

In the United States the disease has chiefly developed in Montana, Idaho, and Wyoming between the months of April and August, the eruptive phenomena in the American cases being purpuric in character and at times generalized. Gangrene, especially of the digits, scrotum, and ears, has occasionally resulted.

Ricketts and King¹ have on the whole confirmed the view originally advanced by Wilson and Chowning,² that the disease is due to a hematozoal parasite and transmitted by a species of tick. Tick fever has been produced in guinea pigs and monkeys by blood inoculations; and one individual of the lower animals has been made to infect another by the medium of the tick. The observations of Mackie³ in the Bombay settlements seem to point conclusively to the part played by body lice in the transmission of this disease.

Etiology.—Manson and other writers on this subject agree that the nature and etiology of this affection are not yet definitely determined.

Treatment.—Prophylaxis is secured by scrupulous personal and domestic cleanliness, with the aid of the mosquito net and the burning of a night-lamp in countries where insects have nocturnal predatory habits.

Treatment is conducted in accordance with the principles of gen-

¹ J. A. M. A., 1906, July 7, Aug. 4. Also Ricketts and Gomez, *J. Infect. Dis.*, 1908, v., pp. 221-244.

² *Journ. Infect. Dis.*, 1904, i., p. 31.

³ *Cf.* the paragraphs in this work on Pediculosis.

eral medicine. Quinine was employed with some success in the American cases.

Chigger Disease (*Sand-flea* bites; Parasite: *Dermatophilus penetrans*; *Sarcopsylla penetrans*; *Rhynocoprion penetrans*; *Nigua*; *Chigoe*; *Jigger*; *Sand-flea*. Fr., *Puce sable*; Ger., *Sandfloh*).

The sand-flea, found originally in tropical America including the West Indies, within the last thirty years has appeared in many portions of tropical Africa and the adjacent islands, as well as in India.

The sand-flea is a minute, brownish-red, egg-shaped parasite, the female of which after impregnation penetrates the skin of man and of the lower animals, including rats and mice. The flea attacks the skin, in man usually about the toes or near the nails, entrance being effected with scarcely painful pricking sensations. Distention of the abdomen of the parasite, which may exceed five-fold its original dimensions, speedily becomes the source of great irritation. In the course of from five to ten days a painful œdema with pustulation follows, occasionally accompanied by lymphangitis or severer symptoms in the form of gangrenous abscesses.

The treatment of the disease is by extraction of the flea with the aid of a heated needle, whereby it is destroyed simultaneously. The resulting wound may be cauterized or dressed antiseptically.

Prophylaxis in "chigger-regions" is of chief importance and secured by sweeping accumulations of dust from walls and floors, which should be regularly dusted with an insecticide powder such as pyrethrum.

MYIASIS.

(Gr., *μῦια*, house-fly.)

Joseph divided all cases of infection by larvæ of flies into (1) myiasis externa, or dermatosa, and (2) myiasis interna, or intestinalis.

There are no dipterous insects attacking man only, but the ova of several species may be deposited in the skin and mucous membranes with subsequent development of larvæ. According to Geber, the ova of several species of *Muscidæ* and *Æstridæ* (of the former, *Lucilia cæsar*, in America; *Stomoxys calcitrans*, in Africa; and *Sarcophylla wohlfarti*, in Russia; of the latter, *Dermatobia noxalis*, *cuterebra*, and *hypoderma*) are occasionally found in the skin and subcutaneous tissue. The following species¹ have been reported in wounds and in other external affections: *Musca domestica*, *Musca stabulans*, *Calliphora vomitoria*, *Calliphora erythrocephalis*, *Lucilia cæsar*.

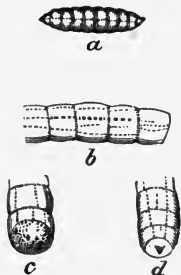
Several specimens illustrating these accidents have been sent to the author. The larvæ represented in Fig. 209 were removed from

¹ Gilbert, Archiv, of Int. Med., 1908, ii., p. 226, covering the entire subject, from which the data following have been abstracted.

the body of an infant in Nebraska. The *Muscidæ* (flesh, house, stable, dung, and other flies) have unarmed maxillæ, and are unable to wound the uninjured skin. The pregnant female seeks, therefore, to deposit her ova where the larvæ, equally unprovided with developed jaws, can most readily secure nutriment. Hence, open wounds and the tender skins of newborn infants when exposed in the summer season, are liable to become the dépôts of such ova. Larvæ of *Muscidæ* have also been found in wounds, in ulcers, in the ear, nose, and vagina.

Screw Worm (*Chrysomya* or *compsomyia macellaria*).—This is the larva of a dipterous insect found in all parts of America but especially in the tropics and in the Southern States of the Union, produced from the ova of an insect laying several hundreds of eggs, which may be deposited on the surfaces of exposed wounds and also in the nasal and aural passages of persons sleeping in the open air. The

FIG. 208.



Æstrus: *a*, the larva, natural size; *b*, some of the segments seen under a lens, and showing the lines of minute projection; *c* and *d*, the terminal ends of the insect. (After ABRAHAM.)

FIG. 209.



Larvæ removed from the body of a child. Of the exact size, after several days in alcohol; *a*, as seen from side; *b*, as seen from beneath.

danger is imminent when offensive discharges from these regions invite the visitation. The white larvæ are about three-fourths of an inch long, and are formed of twelve segments provided with circlelets of small spirally arranged spines, which give them the appearance of a screw and enables them to burrow deeply into the tissues to which they have gained access.

Yount and Sudler¹ have collated 23 cases seen by themselves and others, eighteen of which were instances of nasal myiasis. Two deaths were directly traceable to the incursion of the parasites; in two others life was shortened; the mortality for all was fifteen per cent.; in the nasal cases alone somewhat more than twenty-two per cent. All the patients were attacked out of doors mostly in the nose, the discomfort beginning within twenty-four hours after invasion. This was speedily followed by severe pain, fever, and foul, often hæmorrhagic discharge from the nasal cavity. The parts attacked may become gangrenous; bone may be exposed; and necrotic palatal

¹ J. A. M. A., 1907, xlix., p. 1914, with 3 illustrations.

perforation, pneumonia, and otitis media may result. Manson¹ calls attention to the importance of careful investigation, in countries where the worms are found, of all cases of bloody and offensive nasal discharges. Prophylaxis is secured by avoiding open-air sleeping during the sun-lit hours of the days, as also by especially careful treatment of all nasal and aural discharges and open wounds. Curative treatment is by spraying with chloroform, though pyrethrum, turpentine, and carbolic acid also have been employed.²

Larva Migrans³ (Crocker); "Creeping Eruption" (Hyponomoderma [Kaposi]; Dermamyiasis linearis migrans æstrosa [Krumberg]) is an affection, first described by Lee, later by Crocker, Neumann, Stelwagon, and others, in which a migrating larva (supposed to be that of a bot-fly, *Gastrophelus*), 1 mm. in length with ten segments and hooklets and two head-end suckers, burrows in the skin and produces a slight elevation of the surface above the cuniculus, pale rose pink or slightly reddish in hue. Erythema or vesiculation in a continuous or interrupted bead-like linear lesion represents the track of invasion, crusted or fading in the older portion. The thread-like line is pushed forward from a fraction of an inch to several inches each day. The line may be tortuous or irregular and extend over a large part of the body-surface. Black nits are said to be found upon hairs near the burrow. In rare cases two parasites may be present. Gilbert⁴ states that these larvæ have been known for centuries to be parasites of man.

Stelwagon, whose description has been followed in these paragraphs, corroborates the findings of Sokolow and Samson-Himmelstjerna, which recognize as the starting-point of departure of the parasite the regions most exposed to inoculation (hands, fore-arms, feet, lower portion of the legs, buttocks, and adjacent parts of the back). In his four cases the invasion probably occurred during a visit to the sea-shore.

Treatment is by cauterization of the invaded areas. Stelwagon advises cataphoretic applications of mercuric chlorid, two grains to

¹ Loc. cit.

² Wirsing, Deut. med. Woch., 1906, No. 23.

³ Literature: A Case of Creeping Eruption (Lee), H. W. Stelwagon, J. C. D., 1903, xxi., p. 503; idem, B. J. D., 1904, xvi., p. 192; idem, J. C. D., 1904, xxii., pp. 359-362; cf. also his treatise, 1907, 1107 (cut and bibliography to date). Eduard Kengsep, Epidermititis Linearis Migrans, Centralb., 1906, ix., pp. 194-199 (the writer concludes by giving a résumé of the literature of the subject and discusses the nomenclature and pathology of the disease). J. B. Shelmire, Report of a Case of Creeping Eruption, J. C. D., 1905, xxiii., p. 257. Van Harlingen, Am. Jour. Med. Sci., 1902, Sept., (3 cases, 4 cuts). Louis P. Hamburger, Creeping Eruption: Its Relation to Myiasis, J. C. D., 1904, xxii., pp. 217-227, (1 hist. illustration, 1 clin. illustration, bibliography). Hutchins, Creeping Disease: Report of two cases of larva migrans with special reference to the treatment, J. C. D., 1906, xxiv., p. 270. Lenglet and Delaunay, A Case of Larva Migrans, Annales, 1904, s. iv., v., p. 107. Moorehead, Creeping Disease, Texas Med. News, 1906, xv., p. 167. Neumann, Fall von, Creeping Disease, Verhandlungen der Wiener dermat. Gesellschaft; Archiv, 1906, lxxxii., p. 421. J. E. V. Boas (Kopenhagen), "Larva migrans," eine Gastrophiluslarve in der Haut eines Menschen in Dänemark, Monatsh., 1907, xlv., pp. 505-512, (Ref., 4 illus.).

⁴ Loc. cit.

the ounce (.133 to 30.) to the area surrounding the advanced line of the burrow.

Æstrus bovis (*Gadbreaze, gadfly*).—This insect also may deposit its ova in accessible parts of the human body, with the result of producing painful swellings moving from one point to another, which may suppurate and discharge the larval contents. Walter Smith, of Dublin,¹ has described a case where an ovum deposited in the ankle of a twelve-year-old girl moved to the elbow and there discharged a grub nearly an inch in length. Birdsall² describes two worms, one-fourth and one-half inches long, and one-eighth of an inch in thickness, escaping from between the middle and ring fingers of the hand of one patient; and a second instance where the leg was attacked. The specimens came from Gaboon on the West Coast of Africa, the fly (family *Estridæ*) responsible for the mischief being reported as attacking the gorilla and the native tribe engaged in capturing these animals.

Cephenomyia.—Several species of this genus are found parasitic in the nasal sinuses of sheep, in which they occasion very severe symptoms. Wesley Thompson³ reported a case in a man in San Bernardino, California. The patient, who had previously suffered from nasal catarrh, showed an accelerated pulse and fever, the nose was swollen and the nares nearly closed with dried blood and mucus. Forty larvæ were removed.

The larva of *Dermatobia cyaniventris*, of this genus is known and described under various local names, as the *ver macaque* (monkey-worm), *torcel*, and in Mexico, *moyociul*. It is found in South and Central America and cases have been reported in the southern portion of the United States. It has so frequently affected man as to become known as the *Æstrus hominis*, under which title it has been frequently described in literature.

In man, however, the flies are most commonly found developing in suppurating wounds and ulcers, and in chronic ear and nose affections, where there has previously been considerable discharge. In Egypt the larvæ have been found in ulcers beneath the eyelid.

Larvæ of this family have also been found in furunculous swellings beneath the skin, in the vagina of girls and women, especially where there has been a discharge. They are even reported to have penetrated the cranial cavity from infection of the sinuses or by orbital fissure.

¹ Int. Med. Congress—Archiv of Derm., Jan., 1882.

² N. Y. Med. Record, 1882, Mar. 18, p. 298.

³ Quoted from Gilbert, loc. cit.

PARASITIC DISEASES OF VEGETABLE ORIGIN.

MYCETOMA.

(Gr., *μύκης*, a fungus.)

(PODELCOMA, MADURA FOOT, MORBUS PEDIS ENTOPHYTICUS, ULCUS GRAVE, ENDEMIC DEGENERATION OF THE BONES OF THE FOOT, MORBUS TUBERCULOSUS PEDIS, ELEPHANT FOOT, MADURA DISEASE, FUNGUS FOOT OF INDIA, FUNGUS DISEASE OF INDIA, "EGG-FOOT." *Ger.*, MADURAFUSS; *Ind.*, PERICAL, SLIPADA; *Fr.*, MYCÉTOME, PIED DE MADURE.)

Mycetoma is a localized affection limited to the skin and adjacent parts, due to invasion of the tissues by vegetable parasites, and characterized by the production of an unshapely tumefaction of the invaded part, which becomes covered with nodules or tubercles for the most part permeated by fistulous sinuses. The disease not only affects the skin, but also the underlying structures to a variable extent. It long was thought to be a malady occurring only in India, but more lately has been recognized in China, Syria, parts of Africa, and in both North and South America.

The record of its first recognition on the American continent is embodied in the apparently unsupported statements of Ruelle,¹ who reports that Collas observed one case at La Réunion, Grall and Grand-Mourrel each one case in Guiana, and Layet one in Chili and another in Valparaiso. McQuestin saw three cases affecting native Mexicans in the Civil Hospital of Hermosillo, and Kemper reported a case which for some years was thought to be the first occurring in the United States, but a critical examination of the description of the acute symptoms presented by his patient raises doubt respecting the accuracy of the diagnosis. Parkes reported that he had operated successfully upon a patient suffering from mycetoma in the city of Chicago. The disease, however, had been contracted in India.

The first case certainly known to have originated in North America in which no question exists as to the diagnosis was reported by Adami and Kirkpatrick. Soon after the appearance of this

¹ Bibliography: Adami and Kirkpatrick, *Trans. Assoc. Amer. Phys.*, 1895, x., p. 92. Arwine and Lamb, *Amer. Jour. Med. Sci.*, 1899, cxviii., p. 293. Boyce, *Hyg. Rundsch.*, 1894, iv., No. 12. Surveyor, *Brit. Med. Jour.*, 1892, p. 575. Carter, *Treatise on Mycetoma, or the Fungus Diseases of India*, London, 1874. Dantec, *Le, Arch. de méd. naval*, 1894, p. 447. Gémy and Vincent, *Annales*, 1896, s. iii., vii., p. 1253. Hatch, Keith, and Childe, *Lancet*, 1894, p. 1271. Hyde, J. N., and Senn, N., *J. C. D.*, 1896, xiv., p. 1. Kanthack, A. A., *Lancet*, 1892, i., p. 195, and ii., p. 169; *Jour. Path. and Bact.*, Oct., 1892. Manson, *Tropical Diseases*, 4th ed., p. 760. Paltauf, *Intern. klin. Rundsch.*, 1894, No. 26. Pope and Lamb, *N. Y. Med. Jour.*, 1896, lxiv., p. 368. Ruelle, *Contribution a l'étude de mycétoma*, Bordeaux, 1893, p. 13 *et seq.* Scheube, Faleke, Cantlie, *loc. cit.*, p. 552 (full bibliography). Shah, T. M., *Med. Rep.*, Calcutta, 1893, p. 225. Vincent, *Annales de l'Inst. Past.*, 1894, p. 129. Wright, *Trans. Assoc. Amer. Phys.*, 1898, xiii., p. 471. Emma Dubendorfer, *Ein Beitrag zur Histologie und Bakteriologie des Madurafusses*, *Archiv*, 1907, lxxxviii., Band 1, pp. 3-10, 1 clin. illustration, 4 hist. illustrations. Clemon, *Brit. Med. Jour.*, 1906, Ap. 21, p. 918.



Mycetoma of the Foot.

(From a Painting.)



report, in connection with Senn and Bishop, I published the record of a case of mycetoma occurring in a native of Iowa who had never been outside of his native State before visiting the city of Chicago. Pope and Lamb, Wright, and Arwine and Lamb also have published reports of cases, with demonstration of the fungus and its subsequent artificial cultivation. This record of five cases of Madura foot in North America includes the history of four men and of one woman.

The disease was referred to first by Kampfer in 1712, but was differentiated clearly from elephantiasis first by Godfrey in 1843. It has been studied carefully since by Ballingall, Eyre, Carter, Kant-hack, Bocarro, Surveyor, Gémy, and Vincent.

Symptomatology.—Three varieties of mycetoma were once loosely distinguished by the color of the morbid material contained in the discharge, viz., the black, the red, and the white, or ochroid; the last named the most common, the second the rarest, the black rather less frequently encountered than the white. The part principally affected in most of the Indian and in the American cases is the foot, and this chiefly of persons walking barefoot; but the hand, the shoulder, the thigh, the knee, the toe, the abdominal wall, the scrotum, and other regions have been attacked. Simultaneous involvement of different regions of the body has never been noted.

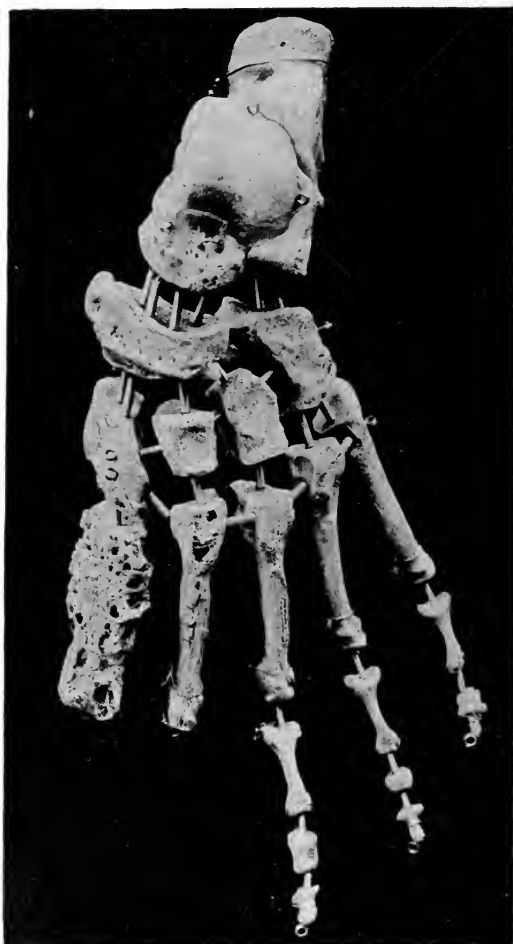
In a typical case the sole of the foot is involved by progressive spread of the disease from the site of a trifling traumatism which often at first heals and is followed later by the development, near the site of the wound, of a rounded, firm, painless, small nut-sized, subcutaneous button or nodule which increases slowly in volume and later is surrounded by similar lesions. In the course of five to ten weeks or more, the tumor softens and bursts, discharging a characteristic, viscid, "oily," semi-purulent, blood-streaked fluid which contains minute, roundish (grayish, reddish, or blackish) particles, which have been compared to fish-roe. These may be agglomerated in pea-sized masses. At the site of each lesion a permanent sinus penetrates deeply beneath and is said never to undergo spontaneous healing. The repetition of the process by the multiplication of nodules and fistulous tracts produces eventually the deformity characteristic of the disease. The progress of the malady may be exceedingly chronic, as ten and more years have been recorded not rarely as requisite for its complete evolution.

In fully developed cases, when the foot is involved, the organ is seen to be largely increased in volume, producing without elongation an elastic bulging of the parts posterior to the digits over the dorsum above, and below over the plantar region, giving the sole a convex appearance. The toes may be in forced separation or misdirected. Over the tumid parts the skin is beset with numerous pea- to nut-sized isolated nodules, elevated to the extent of several millimetres above the general level, each pierced with a fistulous channel extending from without to the deeper structures. At times these fistulous tracts lead only to the soft parts and especially to muscular tissues; at

others the surface of the bone is reached and the osseous tissue is eroded by the growth of the parasite and the coccogenous infection which results from long exposure of the parts to the air. It is through these fistulous orifices that in different cases exit is given to a blackish, fish-roe-like substance, or to a whitish material, or even still more rarely, as indicated above, to a reddish substance.

In place of nodules or papules, the skin may be the seat of pustules, of vesicles, of bullæ, or even of abscesses. When but relatively small organs of the body are invaded, such as a finger or a toe, it becomes clear that the tumefaction is not due chiefly to a

FIG. 210.



Osseous lesions in mycetoma.

hypertrophy either of the integument or the bones. When the foot is affected seriously, the leg above commonly atrophies from disuse.

The discharge varies in different cases. In some it is almost wholly wanting; in others it is scanty; in yet others exceedingly profuse and fetid. It is generally oily or syrupy in character. When blackish in hue, the contained granules have been likened to truffles or fish-roe; when of paler hues, it resembles fish-spawn.

The course of the disease is exceedingly chronic; and while one or more nodules have been seen to heal, the mass of the disease persists until relief is obtained by artificial methods.

Pain is usually not pronounced; sensibility is maintained; and the general health may be undisturbed for long periods of time. Death, when it ensues, results from long-continued drain upon the vitality of the patient.

Diagnosis.—In all cases of long standing, the disease is readily recognized by the characteristic deformity produced; in certain varieties of the affection by the escape of fish-roe-like particles; and in all, by microscopic recognition of the parasites present. In well defined instances, the nodes or papules externally visible are often perforated with sinuses leading downward to the deeper structures. The painlessness of the invaded part is also characteristic.

Etiology and Pathology.—The disease is caused by invasion of the tissues of the body by vegetable parasites. It is probable that the parasites secure access to the skin by the medium of a traumatism, and the occurrence of a large majority of all cases on or near the foot, most often in men and among individuals who have been walking barefoot, lends support to this view. Further, the origin of a few cases has been traced to foot-lesions (bruising of the organ with a stone and consequent abscess; injury with a pitchfork, a fall on the knee, etc.); while the relative freedom of persons who protect the feet while residing in the districts where the disease is common, is in evidence. The lower class of poor agriculturists, during the twentieth to the fiftieth year of life, are most liable to the affection, while children and infants escape. The origin of the disease has not been traced to any peculiarities of soil.

The following is a brief abstract of the classification of the fungi responsible for the several varieties of the disease given by Brumpt, and cited by Manson:

1. Actinomycotic Mycetoma: Caused by *Discomyces bovis* (ray-fungus) (Harz, 1877). Sulphur-yellow granules, 0.75 mm. in diameter; radiating mycelia in felted masses; clubs at ends representing actively growing protoplasm.

2. Vincent's White Mycetoma: Caused by *Discomyces maduræ* (Vincent, 1894). Grains, pin-head to pea-sized, yellowish-white, soft, with mulberry surface; filaments, radiating, between which are numerous lymphocytes also arranged in radiations. Detached shoots reproduce characteristic structure. Does not attack osseous tissue.

3. Nicolle's White Mycetoma: Caused by *Aspergillus nidulans* (Eidam, 1883). Grains spherical, smooth, pea-sized. The organism attacks bone.

4. Bouffard's Black Mycetoma: Caused by *Aspergillus bouffardi* (Brumpt, 1906). Grains, black, pin-head- to small-shot-sized, mulberry surface, smooth and glossy, often surrounded by giant and epithelioid cells. Densely felted silvery mycelium with peripheral zone of irregular moniliform threads; dark brown interstitial substance.

5. Classic Black Mycetoma: Caused by *Madurella mycetomi* (Laveran, 1902). Grains, dark-brown to blackish color; composed of white threads 1 to 10 mm. in diameter; cement substance dark brown with connective tissue capsule.

6. Brumpt's White Mycetoma *Indiella mansonii* (Brumpt, 1906). Grains, hard, white, minute, lenticular in shape, one-fourth to one-fifth mm. in diameter; large hyphal threads with connecting cement-substance.

7. Reynier's White Mycetoma: Caused by *Indiella reynieri* (Brumpt, 1906). Soft, white grains composed of densely felted hyphal threads in coiled strands terminating in divided chlamydospores.

8. Bouffard's White Mycetoma: Caused by *Indiella somaliensis* (Brumpt, 1906). Grains, white to reddish-yellow, small, smooth, averaging 1 mm. in diameter; always found in giant cells; not enclosed in nodules; highly destructive.

In a well-advanced case on section the foot is found to be tunneled in various directions by sinuses which communicate with oval or roundish cavities. The latter may be superficial or deep and may occupy the soft tissues or the bones, and have a connective tissue lining. Here the granules singly or in masses (mulberry-like) are found as well as in the neighboring softened tissues.

In the period of early reactive inflammation, the fungus is surrounded merely by the results of cell-proliferation; typical granulation-tissue, epithelioid cells, and new-vessel formation follow. Somewhat later plasma cells, giant cells, and amorphous granular masses occur and finally degenerative changes attack the entire area.

The bones when denuded are found to be honeycombed with finely carved seams, depressions, furrows, and pits, leaving delicate spicula of osseous tissue projecting between the excavations wrought by the growth of the parasite. It is possible to find, as Adami suggested in the study of his case, intrusive organisms the result of exposure for so long a period of time of the deeper tissues to the atmosphere.

Treatment.—Early in the disease potassium iodide may be employed with curettage and packing of the superficial lesions. As a rule amputation is the only method of eradicating the disease.

Prognosis.—As spontaneous recovery does not occur, the prognosis depends upon the treatment employed.

ACTINOMYCOSIS OF THE SKIN.

(Gr., *μύκης*, and *ἀκτίς*, mushroom.)

"LUMPY-JAW." *Ger.*, AKTINOMYKOSE; *Fr.*, ACTINOMYCOSE.)

In 1877 Ponfick proved that the disease, first recognized by Bollinger in the jaws of cattle was the same as that which Israel in 1877 had observed in man.¹ Hartz, judging largely from its mor-

¹ Illustrations: Neumann's Atlas, Plate XIII.; Morris, Lancet, June 6, 1896; Pringle, Med.-Chir. Trans., 1895; Kopp's Atlas, Plate LXXV.; Corlett—cut appearing in Stelwagon's treatise, p. 1050; Illich, Wien., 1892; Darier et Gautier, Annales, 1891, p. 449; Ponfick, Treat. Berlin, 1882; Israel, Treat. Berlin, 1884; Skerrett, Amer. Jour. Med. Sci., 1887; Poncet et Bérard, Trait., Paris, 1898; Bodamer, Med. News, 1889; Crookshank, Lancet, 1898, p. 11; Legrain, Annales, 1891, s. 3, ii., p. 772; Baracz, Wien. med. Presse, 1889, xxx., p. 6; Ljunggren, Nord. med. Arch., 1895; Kopfstein, Wien. med. Rundschau, 1901, p. 21; MacCullum, Centralbl. o. Bakliv., 1902, xxxi.; Howard, Jour. Med. Resch., 1903, ix., p. 301.

phological characters, described the parasite as the ray-fungus. Maiocchi was first to describe the disease as it involves the skin.

Symptoms.—In actinomycosis, the parasite commonly gains access to the economy by the mouth, especially by the avenue of a carious tooth; and the skin, when implicated, as a rule is involved secondarily. Such skin-lesions displayed are more often about the face and neck, more particularly the lateral surfaces of the neck beneath the jaw, where deep subcutaneous nodes, tumors, or swellings, often firm to the touch, livid in hue, thinning at one or at several points after involvement of the integument, finally burst, forming fistulous tracts and giving exit to a serosanguineous or bloody and purulent fluid, containing friable, yellowish or grayish masses in which the fungus may be recognized. The orifices of the sinus or sinuses after such discharge are usually beset with cutaneous and subcutaneous nodules and uneven lumps, some softened, others firm and indurated, usually reddish or purplish in hue, tender, painful, and often accompanied by pains elsewhere, particularly in mastication, in deglutition, and in certain movements of the head on the neck. The outlying skin becomes infiltrated, tumid, empurpled, and boggy. Rarely papillomatous growths develop.

The onset of the disease is insidious, and though occasionally rapid in its career, its evolution may extend over months and even years. The nearer to complete development of the disease the more rapid, as a rule, is the oncoming of its symptoms. In exceptional cases the malady attacks the fingers, the hands, and other parts of the body. Rarely, secondary actinomycosis of the lymphatic glands occurs. Pringle reported a case in which large areas on the back, lumbar region, and hip were affected secondarily after involvement of deeper organs.¹ Lymphatic metastasis is, however, rare, due, as is believed, to the large size of the fungus-granules as compared with the lumen of the lymphatic vessels. Subjective symptoms may be insignificant or be related to the pain and stiffness of the neck concurrent with the subcutaneous abscesses.

Diagnosis.—All supraclavicular and submaxillary lesions constituted of dark-reddish tumors or swellings, subcutaneous in origin, call for scrutiny. Scrofuloderma is to be recognized by the general condition of the patient (actinomycosis may occur in vigorous young adults); by the absence of pronounced gumma and lymphoma ("gomme scrofulouse"); and by failure of recognition of the parasite, which is not easy of detection. The occupation of the subject of the disease (as a farrier, stable-boy, or drover) may furnish a clue to the origin of some cases. Care should always be taken, in making a diagnosis, to exclude cases of swellings discharging pus, practically limited to the skin immediately over the lower jaw, with sinuses leading to the bone beneath, in which the disorder is exclusively due to a carious fang of one of the lower central or canine teeth. These should be relieved by extraction of the offending tooth.

¹ Med.-Chir. Trans., 1895, lxxviii., p. 21.

Etiology and Pathology.—More men than women are attacked as a result of special exposure; a few of the affected have been occupied with cattle and horses; others having carious teeth may have been infected by accidents of contact or in the operations of dentistry. The subjects are usually young adults, though we have treated a male patient over sixty years of age. Cases are on record of transmission from man to man, from animals to man, and by traumatism when inanimate objects were the media by which the fungus was introduced. The affection is communicable by inoculation. In most instances there have been submaxillary lesions and carious teeth. The general dispersion of the fungi in the atmosphere, water, and upon the soil is held to explain in large measure the occurrence of the disease in man. Beards of barley, bits of wood and stone, vegetable fragments, etc., have been found in actinomycotic lesions.

The pathological anatomy of actinomycosis is practically that described above in mycetoma. In the most commonly recognized type of the disease, the fungus is found in the yellowish or grayish masses discharged in clumps from the fistulous tracts and found also in sections of morbid tissue. Often there are seen fine interlacing threads or filaments radiating from a common center, some considerably projected above their fellows, many with a bullous expression at the tip ("clubs"). The threads are slender, sinuous, often with dichotomous branches and have an external sheath and protoplasmic medulla. The filaments grow rapidly and probably produce the disease. Coccus- and bacillus-like cells, regarded by Boström as spores, are also present.

Treatment.—The treatment is by surgical procedures, ablation, erosion, antiseptis by mercuric chloride, Lugol's solution, boric acid, and dressings with antiseptic gauze. Gautier has employed with success an electro-chemical method of treatment, by the use of platinum needles and injections of a 10 per cent. potassium iodide solution. Two needles are inserted, one connected with each pole of the battery, and a current of fifty milliampères is passed; a few drops of the iodine solution are injected during the flow of the electricity, the patient being anæsthetized. Before attempting surgical measures potassium iodide given internally should be tried, since it has proved successful in many cases. Schlange, at the Congress of German Surgeons held in 1890, called attention to the fact that of nearly two hundred patients under his observation (over half traced since 1886), forty were completely cured for more than two years; and in eighty the disease remained limited to the head and neck. After thirteen years of involvement one patient at the date of the report was alive. All extensive operations for relief of the malady are now abandoned. Even actinomycosis of the lungs and viscera is susceptible of spontaneous recovery. Cases apparently hopeless have recovered in five and six years. Intestinal complications are grave. Pringle's patient improved under potassium iodide. Untreated the disease may eventually destroy life after years of an exhaustive drain.

Prognosis.—It was held until lately that the prognosis was favorable only in case of thorough and prompt removal of all diseased tissue. In other cases a fatal result was anticipated.

MYCOTIC DERMATITIS.

Dhobie Itch (*Washerman's itch; Crutch itch; Arm-pit itch*).

The term *Dhobie itch* is employed very generally in tropical countries, more particularly in the Philippine islands, for the designation of a group of itching affections of the skin, mostly though not invariably, due to vegetable organisms of the family of the microsporons and trichophytons. The popular name by which some of these cutaneous affections are recognized, represents the common belief that they are transmitted by the medium of the clothing contaminated in the processes of the laundry. We have had several of the cases thus designated under our observation the most of them differing widely in their etiological origin.

Stitt¹ calls attention to the fact that the "fulminating" types of Dhobie itch are mixed cases of staphylococcic invasion and parasitism due to a mould fungus present. This symbiosis is possibly the cause of the severe character of the process.

Manson calls attention to the severity of all epiphytic affections in hot countries and to the distress which they occasion as a result of the dermatitis aroused by itching, scratching, friction, and the frequent secondary infections producing often boils and abscesses.

Respecting the groups of epiphytic diseases observed in hot countries Manson recognizes a mycotic *pityriasis flava* as seen in Ceylon, which are frequently called Dhobie itch, produced by the *Microsporon tropicum*; a white form produced by *Microsporon macfadyeni*; and a black form seen by him in China (*Microsporon mansonii*), producing black hemispherical forms when cultivated on maltose agar. He believes that many cases of Dhobie itch are of the nature of erythrasma due to the *microsporon minutissimum*.

Diagnosis.—The diagnosis is to be established by the microscope; the treatment should be that outlined in the chapter of this treatise devoted to the several forms of Ring-worm.

Treatment.—Prophylaxis is to be secured by the wearing of proper clothing; by scrupulous cleanliness, and by the free use of borated dusting powders.

Tinea Imbricata.—(*Tokelau Ringworm; Burmese, Chinese, or India Ringworm; Bowditch-island or Scaly Ringworm, Lafa Tokelau, Pita, Cascadœ, Gune, Herpes Desquamans, Tinea Circinata Tropica, Gogo. Fr., Herpès tonsurans desquamatif.*) This disorder was portrayed first by Alibert in 1832, and described first in 1844 by

¹ J. C. D., Mar., 1908, p. 107.

Fox, and has been studied since by Turner,¹ Manson,² MacGregor,³ Königer,⁴ Roux, and others.⁵ It is a malady due to the presence of a vegetable parasite and is found chiefly in the South Sea Islands and those of the Malay Archipelago. It has been recognized also in isolated cases both in India and China.

Symptoms.—The disease is first declared, after artificial inoculation, by a period of delay ("incubation") lasting about nine days, after which minute reddish points appear, arranged for the most part in semicircles, the former rapidly developing into papules producing an intolerable pruritus. The growth thenceforward is reported to be at the rate of from five to ten millimetres each week. In a brief time lamellæ of epidermis are detached, their free border being directed to the centre of the circular disk, the patch or patches when fully developed being represented by concentric rings, about five millimetres apart, suggesting a resemblance to "watered silk." The scales may be as large square as half a centimetre, with curling edges which later become horny and much darker in color. It is said that the hand passed over such patches from the circumference to the centre recognizes a smoothness of the surface, but when the motion is reversed, from centre to periphery, the scales are raised and resist the fingers. The appearance of the older patches suggests a skin covered with clay. The process of production of the concentric rings is reported to be, first, by the elevation of a central point of the epidermis and the formation there by the fungus of a brownish mass; then by separation of the epidermis at the central point, with persistence for a time of attachments at the border; then by liberation of the attached edge by friction or otherwise; and finally by exposure of the corium. Just beyond this line a brownish rim declares the line of advance of the fungus beneath the epidermis. When the ring thus formed has attained a diameter of about five millimetres, a brown point again appears centrally, and there is a repetition of the process originally observed in the primary ring.

All portions of the body and large areas of the general surface may be affected; but the scalp, face, palms and soles, axillæ, and nails seem usually to be spared; when the hairy parts (scalp, pubes, axillæ) are involved, the disease spares the follicles, and its management is thus declared to be correspondingly facile. Though the hairs themselves are not invaded, they are said to fall when the disease extends over the hairy regions of the body. When the disease spontaneously disappears from any portion of the integument there are left persistent, deep-colored rings or circles where the scaling originally occurred.

The itching is commonly intense; the scales at times (and in

¹ Glasgow Med. Jour., 1870, p. 502.

² Tropical Diseases, p. 628; China Imp. Merit. Cut. Med. Rep., 1879, xvi., p. 1; Med. Times and Gazette, 1879, ii., p. 342.

³ Glasgow Med. Jour., 1876, p. 343.

⁴ Virchow's Archiv, 1878, lxxii., p. 413.

⁵ For bibliography, see Scheube, Diseases of Warm Countries, p. 526.

places relatively inaccessible to the hands in scratching, such as over the interscapular region) may be half an inch in diameter and from one-eighth to half an inch apart. When bulky and corneous, they give to the body the aspect of being clay-coated. The patches may extend at the rate of from one-quarter to a half an inch each week. A somewhat characteristic "piebald" appearance is produced in places where the scales have been removed and the resulting pigmentation is partial. The scaling is most marked in parts contiguous to healthy skin. The disorder is exceedingly chronic in career, but is modified, especially in its pruritic symptoms, when occurring in milder climates.

Etiology.—*Tinea imbricata* is a contagious disorder affecting persons of both sexes and all ages, and is produced by a vegetable parasite. The disease in certain localities is endemic. It has been produced by experimental transmission from a diseased to a healthy skin.

Pathology.—The fungus recognized in microscopic examination of the scales from a morbid patch after moistening with liquor potasse, resembles that of the trichophyton. Saboraud and Nieuwenhuis believe it to be a variety of the large-spored trichophyton. Tribondeau reports that it is not a trichophyton, but an aspergillus, termed by him *lepidophyton*. The growth of the organism is in the lower epidermis, sparing, however, the hair-pouches. The mycelium is thick and interlaced, compounded of short, rounded segments which branch dichotomously. It has been cultivated on nutrient media. The spores are oval, pigmented in dark-reddish hues, and irregularly contoured. The proportion of spores to mycelium differs in different observations probably as a result of the different age of the specimens under examination. As the fungus does not perish in the regions invaded, it burrows rapidly beneath the newly formed epidermis as soon as the latter is formed. In this way Manson explains the features of concentric scaling and the persistence of the disease.

Diagnosis.—The diagnosis from "Giant Ringworm," "Boatman's Ringworm," Dhobie Itch, "Majee's Dad"—forms of trichophyton as it occurs in luxuriant vegetation upon the smooth portions of the body in tropical countries—is made readily. In these forms of ringworm the central area clears, while in *tinea imbricata* the central part of the patch is made up of concentric rings. The recognition of the parasite is essential.

Treatment.—The scales are removed readily with soap and water or by alkaline baths, and chrysarobin, pyrogallol, or iodine ointment (Manson advocates strong linimentum iodi) is well rubbed into the part. In some cases strong lotions are employed of the same chemical constitution. The clothing of the patient should be boiled if not destroyed by burning.

Prognosis.—The prognosis is favorable.

Pinta.—Sp., *Pintar*, to paint. *Mal de los Pintos*, *Mal Pintado*, *Pinto*, *Cuté*, *Cativi*, *Tinna*, *Quirica*, *Spotted Sickness*, *Spotted Dis-*

ease of Central America, Ponnus Carateus. Fr., *Carathè*.) Pinta is an endemic contagious dermatomycosis, characterized by the development of pigmented patches upon the skin in different colors, unconnected with the general health of the patient and affecting subjects of both sexes and all ages.

The disease occurs in tropical America, especially in Mexico, Central America, Venezuela, Colombia, Bolivia, Chili, Peru, and Brazil; but it has been found also in North Africa, and, it is believed, also in Guiana.¹

Symptoms.—Pinta begins at one or several points of the body-surface, whence it is distributed more or less generally by auto-infection. The disease by some authors is said to be preceded by prodromata of chills, fever, anorexia, cephalalgia, diarrhœa, and emesis, lasting for one week, the cutaneous symptoms developing about one month later. The occurrence of such a prodromal stage has, however, been denied.

The eruptive symptoms develop gradually. The hands, face, and other exposed parts usually are involved first. Large areas subsequently are formed by increase in the dimensions, and also by coalescence of original macules, the spread of the disease being asymmetrical and peripheral. The spots may be characteristically yellowish, reddish, bluish, blackish, whitish, or gray, the hue at first being monochromatic; later, as the disease spreads, the different colors named above may be exhibited side by side. The patches are well defined, and do not affect the palms and soles. On the scalp the hairs whiten and fall.

The surface of the body, when extensively involved, presents an odd-looking, piebald appearance, due in part to epiphytic changes and in part to the development of vitiliginous patches in the skin. Itching is produced in various degrees, according to the extent and severity of the disorder. When the affection has lasted for some time, a disgusting odor is exhaled, and the surface exfoliates, an early furfureaceous desquamation being replaced later by scaling in large flakes.

Two types are described: one superficial, represented by blackish and bluish patches; and a deeper form, said to be more obstinate, with reddish and whitish patches, in which the deeper portions of the epidermis are involved.

Though displayed for the most part asymmetrically, the patches may cover the entire surface of the body, and even invade the mucous membranes of the alimentary tract. When confluence occurs, large areas of the skin may be involved, displaying then the usual features of hyperkeratinization, with pityriasis, occasionally larger and coarser, scales, infiltration, occasional fissuring, and complete or partial color-change and loss of hair. In final evolution the symptoms are highly suggestive of other dermatoses, such as trichophytosis, favus, some of

¹ Bibliography: Edgar from Jour. Trop. Med., p. 531. Manson, Tropical Diseases, p. 776. Gomez, Du Carathés ou tache endémique des Cordillères, Paris, 1879. Hirsch, Handbuch histo.-geogr. Pathologie, 1883, 2d ed., ii., p. 263. Montoya and Florez, Annales, 1897, s. iii., viii., p. 464.

the forms of lupus, and erythematous eczema. There may be ulcerative complications.

Etiology.—Pinta is a contagious disease, affecting persons of both sexes and all ages save infants; but is much more common among the filthy and the neglected than in others. It is produced by the growth of a cryptogamous fungus in the superficial portions of the skin.

Pathology.—Scales scraped from the skin moistened with liquor potassæ and placed under a microscope, exhibit round or oval, blackish spores 8–12 μ in diameter; and highly refracting, short, dichotomous filaments of mycelium are distinguishable. The effective parasite recognized by Montoya y Florez (cited by Manson) are fungi, chiefly *Penicillium*, *Aspergillus*, and *Monilia*. Fine filaments furnish hyphæ which terminate in clubs surrounding chaplets of spores. Sterigmata encircle the sporulating elements. The fungi are found chiefly in the superficial layers of the epiderm, but may also, in advanced cases, be recognized in the rete. Whether the differences in color be due to variations in the fungi, or to pigmentation of the spores and filaments, is not determined.

Diagnosis.—The patches of chloasma, vitiligo, and lepra are distinguished readily from those of pinta by considering that, in the two diseases first named, there are no surface-changes in the horny layer of the epidermis, and in the second the existence of a systemic affection is established readily. The absence of anæsthesia in the patches of pinta, the discovery of *microsporon furfur* in tinea versicolor, and of *microsporon minutissimum* in erythrasma, and the special characters of the psoriasiform dermatoses, are all of significance. Care should be taken to exclude the symptoms of the prefungoid stage of mycosis fungoides.

Treatment.—Chrysarobin, sulphur, iodine, naphtol, and, if needed, corrosive sublimate lotions have been found useful. Cleanliness and strict observance of the requirements of hygiene are demanded especially in the class of patients who are affected most often by the disease.

Prognosis.—The disease may persist indefinitely if not relieved. It yields to proper parasiticial treatment. Mild relapses occur. The general health is not involved.

Piedra.¹—(Sp., *piedra*, a stone. Fr., *Trichomycose Nodulaire*.) Piedra is a name given to a disorder affecting chiefly the natives of certain districts in Colombia, South America. Both men and women, more frequently the latter, and persons of all races are liable to contract the disease, which involves the shaft of the hairs of the scalp chiefly, but also the head and other hairy regions. The in-

¹ Manson, l. c., p. 780. Morris, London Pathological Society's Transactions, 1879, p. 441 (with plate), and Medical Times and Gazette, 1879. Juhel Rénouy, Annales, 1888, s. ii., ix., p. 77, and 1890, s. iii., i., p. 766 (with illustrations). Trauchsler, Monatshefte, 1896, xxii., p. 1.

dividual filaments are dotted at irregularly disposed points with minute nodosities, apparently as hard as stone, from which circumstance the disease has acquired its Spanish name. The nodes are pin-head-sized and gritty, so small at times as to be scarcely perceptible to the eye, though distinctly recognized on palpation. A score or more have been found on a single hair sixty centimetres in length. The affected filaments are distorted, and apt to be matted and twisted, as in plica. Each node is fastened to the hair like a sheath, though it may be implanted on one side only; is divided readily with a sharp knife; and is colored in various shades of gray, brown, or black. When a comb is passed through the hairs a distinct crepitation is produced by friction against the dense, nit-like nodes.

The disease has been observed in a few instances in Europe, and once by ourselves in the case of a young girl in whom the eyelashes of both lids on each side were dotted with numerous jet-black, horny, and dense spherical masses, firmly attached to the filaments.

Etiology and Pathology.—According to Juhel-Rénoy, the nodes are composed of numerous spore-like bodies, recognized readily by soaking the hairs in dilute liquor potassæ after washing in ether. The spores are twice the size of those furnished by the trichophyton, are polyhedral as a result of counterpressure, and form a species of tessellated mosaic, the elements of which are united by a greenish soluble cement, in which are incorporated minute rods resembling bacteria.

Other views advanced are that the disease is allied more or less to Beigel and Fox's "chignon fungus," that several varieties of fungus may be responsible for the concretions, and that the origin of the node-like masses is due primarily to a species of mucilaginous oil employed by the natives of Colombia for hair-dressing.

Diagnosis.—The disease is not to be confounded with trichorrhæxis nodosa (though Scheube distinctly affirms that the two are identical), an affection in which the hair-shaft is involved; nor with lepothrix (trichomycosis nodosa), occasionally recognized on the hairs of the axillary and pubic regions; nor yet with monilethrix (*q. v.*), a still rarer affection of the hairs of the scalp.

Treatment.—The disease is relieved readily by soap and water ablutions and by the employment of parasitocides.

Phagedæna Tropica.—(*Tropical Sloughing Phagedæna, Ulcer of Yemen, Aden Ulcer, Cochín China Ulcer, Mozambique Ulcer.* Fr., *Ulcère phagédénique des Pays Chauds, Ulcère endémique, Phagédénisme des Pays Chauds, Sarmes or Sarnes*; Ger., *Tropische Phagedänismus*.) Phagedenic ulceration, varying in type and severity, has been observed in almost all of the tropical countries of Europe, Asia, Africa, and America. While it is not certain that the several disorders to which the name has been given in different parts of the world designate the same morbid state, it is clear that many condi-

tions to which the name has been applied are identical in their nature and possibly those recognized in hospital gangrene.¹

Symptoms.—The onset of the disease is commonly at some point of the body-surface which has been the site of a traumatism slight or severe in grade (excoriations, contusions, insect-bites; or the point where there has been a localized dermatitis from any cause—*e. g.*, syphilis, pus-infection, eczema, etc.). There may be a predisposition to the affection in consequence of a previous state of depressed health. The disease may begin with a single or with multiple lesions, which usually develop over the dorsum of the foot or over the anterior face of the leg.

The first lesions are vesicular or bullous in character, the bursting of which releases a serous or sero-purulent fluid. Ulceration promptly follows with the formation of a necrotic floor made up of indolent granulations, and grayish, pseudomembranous or pultaceous, partly adherent sloughs. The edges are undermined, the odor exhaled from the sore putrescent, and the extension of the disease from centre to both surrounding skin and subcutaneous tissue exceedingly rapid. In the progress of the sore, muscles, tendons, aponeuroses, periosteum, and, in cases, even bone, joints, and the larger bloodvessels may be attacked.

The affected part is exquisitely painful and tender; the surrounding tissues often œdematous and actively congested; the general condition of the sufferer one of extreme adynamia, which may be accompanied by chills, fever, and the signs of a dangerous septicæmia.

Etiology.—The disease is unquestionably more prevalent in those residents of the tropics who have been debilitated by malaria, excessive heat, and moisture of the climate, malnutrition from whatever cause, and similar agencies. Natives as a rule suffer more than visitors from temperate zones. Beggars, men chiefly engaged in severe toil, those exposed in hot and rainy seasons, the uncleanly, and those wretchedly housed, furnish the larger number of all patients.

Pathology.—No single specific organism has yet been demonstrated to be efficient in the production of the disease. An aërobic (Boinet) and also an anerobic (Matzerhauer) bacillus have been believed to be responsible for the disease. Le Dantec recognized bacilli 7 to 12 μ , in length, and immobile. Those seen by Blaisé were longer and bent; those by Crendiropoulo were capable of destroying rabbits and pigeons, the cultures giving off a putrid odor. The rods were two or three times as long as they were broad, with rounded extremities. Sufficiently reduced they produced phagedenic sores in the lower animals.

¹ Scheube, Fälsche, Cantlie, loc. cit., p. 544; Manson, loc. cit., p. 751; Blaisé, Gaz. hebdomadaire de Médecine et de Chirurgie, Oct. 10, 1897; J. Brault, Annales, 1897, s. iii., viii., p. 165; Boinet, ibid., 1890, s. iii., i., pp. 210 and 307; Crendiropoulo, Ann. de l'Institut Pasteur, 1897, xi., p. 784; Le Dantec, Arch. de Médecine Navale, 1885, p. 448, and 1899, lxxi., p. 133; O. Dempwolf, Arch. f. Schiff's u. Trop. Hyg., 1898, ii., p. 282; Legrain et Fradet, Annales, 1897, s. iii., viii., p. 781; Rasch, Ch., Allg. med. Ctr.-Ztg., 1896, lxx., p. 951.

Treatment.—The treatment of tropical sloughing phagedæna is, first, by support of the general health in accordance with the methods universally accepted in science; by thorough erosion, cauterization, and aseptic dressings.

Stoker has employed oxygen and air locally. Where it is practicable, the best local treatment is continuous immersion of the part in water of a temperature as high as is grateful, medicated with boric acid.

As the disease is infective, patients should be isolated.

Prognosis.—When repair ensues, the improvement in the local condition of the sore is by the usual course of granulation, casting off of sloughs, and cicatrization. Mutilations, deformities, anchyloses, contractures, and relapses with fever are not rare. A fatal result may occur from any of the common complications of such a state (intercurrent diarrhœa, pneumonia, hemorrhage, etc.).

INFECTIOUS GRANULOMATA OF TROPICAL AND WARM COUNTRIES.

LEPRA.¹

(Gr., *λεπρός*, scaly.)

(LEPROSY, SATYRIASIS, ELEPHANTIASIS GRÆCORUM, LEONTIASIS, LEPRA ARABUM. *Fr.*, LÈPRE, LADRERIE; *Ger.*, AUSSATZ; *Ital.*, LEBBRA; *Norweg.*, SPEDALSKHED.)

Leprosy to-day is recognized in almost all of the countries of the earth, and groups of victims of the malady, even in considerable number, are found in lands both within and even far to the north of the temperate zone. The disease, none the less, is properly considered with those of tropical and warm countries, for the reason that in these latter are the largest number of affected individuals, and those exhibit-

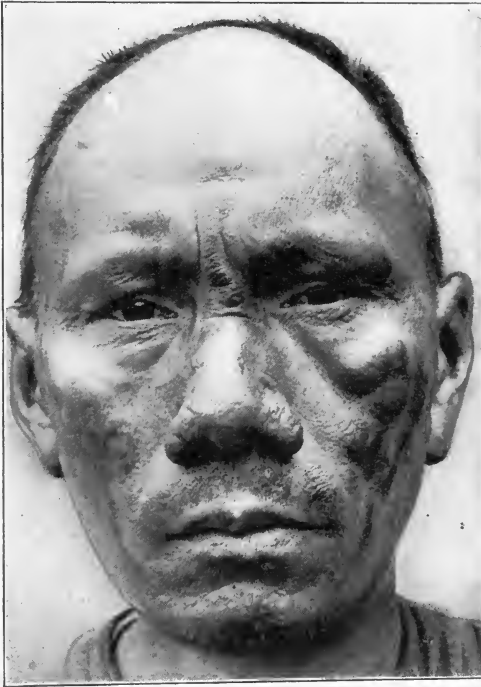
¹ The literature of lepra is voluminous. The references appended include a few of the classical and some of the more recent contributions to the subject. Daniels-sen and Boeck, *Traité de la Spedalskhed*, etc., with atlas, Paris, 1848; A. Hansen, *Archiv*, 1871, *Cong. méd.*, de sc. méd. de Copenhagen, 1884. Van Dyke Carter, *Leprosy*, etc., 1874. Hansen and Looft (trans. by Walker), London, 1895. Leloir, *Traité de Lèpre* (planches), Paris, 1886. Unna, *Zambaco, Leprosy and Syphilis*, *Int. Cong. of Derm.*, London, 1896. *Lepra-Conferenz*, Berlin, Oct., 1897 (three volumes; full bibliography). Santon, *La Leprose*, Paris, 1901 (plates). Victor Babes, *Die Lepra*, Wien, 1901 (68 illustrations, 8 colored plates, and bibliography to date). Campana, *Lepra*, 3d ed., 1907.

Among American contributors may be named: Barnes, *Arch. of Med.*, Dec., 1881, vi., p. 201; Bemiss, *New Orleans Med. and Surg. Jour.*, 1880, n. s., vii., p. 923; Jones, *ibid.*, March, 1878; Dyer, *Phila. Med. Jour.*, 1898, ii., p. 567; Solomon, *Trans. Louisiana State Medical Association*, 1879; Morrow, *Twentieth Century Practice*, vol. xv., p. 403, and *J. C. D.*, 1889, p. 147; Bracken, *Minnesota State Board of Health*, 1901, and *Phila. Med. Jour.*, 1898, ii., p. 1309; McDonald, T. Jonathan, *J. A. M. A.*, 1903, xl., p. 1567 (examination of 150 cases in Hawaii); Douglass W. Montgomery, *Med. Record*, 1902 (spontaneous cure in a leper family), and *J. A. M. A.*, 1894, xxiii., p. 136; Hyde, *Transactions Congress of American Physicians and Surgeons*, 1894, iii., p. 103 (with bibliography); J. C. White, *Transactions International Leprosy Convention*, 1897, vol. i.

ing the severest types of the disorder and its most dangerous ravages.

Leprosy is believed to have originated in the Orient and to be as old as the records of history. Together with a group of dermatoses, probably of a different nature, it is represented without question in the "Zaarath" of the Hebrew Scriptures. Once prominent in the list of the scourges of the old world, its prevalence to-day is restricted in the lands where it still occurs; and it is the rarest of maladies in countries like Great Britain, where it once existed. It is found now in Norway, and to a less extent in Sweden; in Bulgaria, Greece, Russia, Austro-Hungary, and Italy, with a much reduced percentage in middle Europe; in India, Java, and China; in Egypt, Algiers, and

FIG. 211.



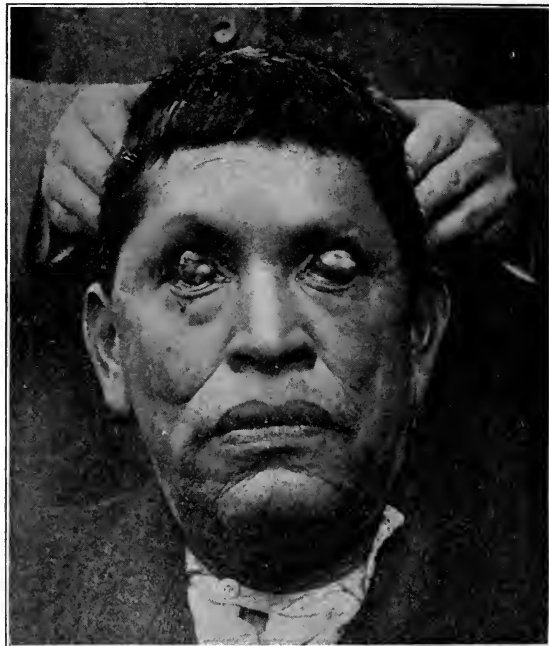
Leprosy. (HOWARD MORROW.)

Southern Africa; in Australia; and in both North and South, including particularly Central America, Cuba, and the Antilles. In the United States it has been recognized chiefly in New Orleans, San Francisco (predominantly among the Chinese population of that city), and in portions of Minnesota, Wisconsin, and Iowa. Isolated cases have been recognized in almost every State of the Union. Leprous patients are presented not rarely at our clinic in Chicago; as also at the public charities of New York, Philadelphia, Boston, and other centres of population. It has been estimated that the number of

lepers in the United States varies between two hundred and five hundred. The disease is represented also in what is reported as a diminishing frequency in the dependencies of the United States, the Hawaiian Islands, Porto Rico, and the Philippines.

Symptoms.—In whatever form leprosy may ultimately be manifested its appearance is preceded usually by the prodromic symptoms

FIG. 212.



Leproma of ocular globe. Epithelial horn pointing upward from eye.
(HOWARD MORROW.)

generally recognized as precursors of severe constitutional disease. These symptoms are: anorexia; cephalalgia; chills, alternating with mild or with severe febrile attacks; depression; epistaxis; gastro-intestinal disturbances; and insomnia. Their duration is exceedingly variable; in some cases patients will remember that these or similar symptoms preceded for years the earliest outbreak of lepra. In other cases but a few weeks' interval occurs between the prodromic and the successive stages of the disease. The character of the prodromata furnishes no clue to the severity and type of the oncoming disorder. The earlier cutaneous lesions of leprosy are tubercular, macular, or bullous. They may be coincident or successive, or one or two of these types may so far predominate that another either may be wanting altogether or may possess in the general pathological history but a trifling significance. It has thus been customary to make an entirely artificial distinction between cases of leprosy by assigning them to

three varieties—tubercular, macular, and anæsthetic. It will be understood, then, in separately considering these three forms, that the distinction between them is useful simply for purposes of clinical classification; that mixed cases of the disease occur which it would be difficult to assign to either variety exclusively; and that each case merely represents a predominance of certain lesions at one pathological epoch. It should be noted also that the symptoms of leprosy are remarkable for their polymorphism, a wide variation often existing between the character of two or more lesions which at any given moment are apparent. This variation is owing largely to the fact

FIG. 213.



Leprosy. (HOWARD MORROW.)

that leprosy is a general and constitutional disorder, the cutaneous symptoms of which are simply its surface-markings.

Lepra Tuberosa (*Tuberculated, Nodulated, or Tegumentary Leprosy*).—From 10 to 50 per cent. of cases are of the nodular type, the larger proportions apparently holding good for colder climates. After the occurrence of chills and a febrile movement of remittent, intermittent, or continuous type, lasting for weeks or months, macular

lesions appear, which are bean- to tomato-sized, reddish, brownish, or bronze-hued patches, roundish, oval, or irregular in contour, well defined and occurring upon the face, trunk, or extremities. The skin covering these lesions is either smooth and shining, as if oiled, or is infiltrated moderately and elevated. The surface of the erythematous spots is often hyperæsthetic. After a period ranging in duration from weeks to years, tubercles (lepromata) rise from the maculations varying in size from that of a pea to that of a nut, though they may be as large as a tomato. They are yellowish, reddish brown, or bronzed in color, often shining as if varnished or oiled, are covered with a soft, natural, or slightly desquamating epidermis, roundish or irregular in contour, and are either isolated or grouped. Numbers of very small and ill-determined nodules may often be recognized by careful examination of the skin in the vicinity of those fully developed. They may fuse and produce broad infiltrations, from the surface of which spring new nodules. They may be either cutaneous or subcutaneous in situation, and be softish or firm to the touch. The eruption of these tubercles is usually at the outset preceded by fever, as well as by œdema of the region involved—eyelids, ears, etc. The lesions are often in varying grades anæsthetic.

The site of predilection of leprous tubercles is the face, and their massing in great numbers upon this region produces the characteristic deformity of the countenance that has given to the disease one of its names, *leontiasis* (face of a lion). In such faces the tubercles are ranged in parallel series above the brows, down the nose, over the cheeks, the lips, and the chin. In consequence of the infiltration and development of the lesions the brows deeply overhang the globes of the eyes, the eyelids become affected with partial ptosis, the lips pout, and the ears are so studded with tubercular masses as to project from the side of the head. The trunk and extremities, including the palmar and plantar surfaces, are then usually to a less degree involved. Other parts which may be invaded are the axillæ, genital and mammary regions, and more rarely the neck and the palms and soles. Occasionally, indeed, with extensive development of tubercles upon the face and ears, there may not be more than from five to fifty tubercles upon the rest of the body, and these either widely dispersed and isolated or agglomerated in a single, hard, flat, elevated plaque of infiltration upon the elbow or the thigh. When confluence of tubercles occurs, large plaques of infiltration may form (*lépromes en nappe*), which are elevated and brownish or blackish in shade (*morpheæ nigra*). In yet other cases the condition described by Bazin as *leprous scleroderma* occurs, in which dense infiltrations extend to both the derm and the hypoderm. The surface of these lesions is roughened, often desquamating, rarely ulcerated.

With these cutaneous lesions there is often involvement of the mucous surfaces, especially the velum palati and the larynx. In the case of the lepers affected with the tubercular form of this disease,

who were exhibited at our clinic in 1879 and 1904,¹ there were marked gruffness and hoarseness of the voice, and the tongue, the larynx, and velum were studded with pinhead- to pea-sized, ashen-hued tubercles. Others may form upon the conjunctiva and the Schneiderian membrane, the gums, the inside of the cheeks, the tongue, the palate, the fauces, and the pharynx.

These tubercles may degenerate into irregularly outlined, sharply cut, glazed ulcers, with a hemorrhagic or sloughing floor, or they may undergo resorption and disappear, leaving pigmented atrophic depressions, or they lose their shape in consequence of partial resorption. A large plaque may flatten centrally until an annular disk is left to indicate its former site.

Among the coincident symptoms of the tubercular exanthem in lepra may be named: disturbance in the functions of sweat and sebaceous secretion, thinning and loss of the hair in the regions implicated (especially of the eyebrows), and disorders of sensibility. Later results are to be noted in a nasal catarrh from implication of the Schneiderian membrane; atrophy of the sexual organs in both sexes with impairment or total loss of procreative power, and remediless blindness, which may result from keratitis, iridocyclitis, or panophthalmia.

It should be borne in mind, however, that the course of the disease is exceedingly slow, and that years may elapse before these several changes are accomplished. The malady, indeed, often appears to be quiescent for months at a time, after which, with the occurrence of fever, acute or subacute manifestations appear, including adenopathy, orchitis, slow or relatively rapid ulcerative processes, followed by gangrene; and a relatively rapid progress may be made toward a fatal conclusion. Long before the latter is reached there are usually, in tubercular leprosy, intermingled symptoms of anæsthetic type, such as the occurrence of bullæ or of anæsthetic patches with and without pigmentation. Toward the last the mutilations effected by the disease may result (*Lepra Mutilans*). Phalanges of the fingers or toes, whole digits, an entire hand or foot may then become wholly or partially detached by ulcerative, atrophic, or other degeneration of skin, bones, and ligaments, hastened or not by intercurrent attacks of lymphangitis, erysipelas, septicæmia, and irritative fever.

The stadium of this type of the disease may extend through ten or more years. After its full development the dejected countenance of the leper, with his leonine facies and general appearance of cachexia is highly characteristic.

Lepra Maculosa (*Maculo-anæsthetic Lepra*, *Erythema Leprosum*, *Leprous Roseola*).—This form of the disease is more common in tropical than in cold countries and is distinguished chiefly, as its name implies, by its macular lesions. These lesions have the general

¹ Chicago Med. Jour. and Exam., 1879, xxxix., p. 561, with cut showing appearance of larynx.

character of those described as preceding the appearance of the leprous tubercles. In size they vary from that of a small coin to areas as large as a platter. They are diffused or circumscribed, roundish or irregularly shaped, and in color yellowish, brownish, or bronzed, often shining or glazed. They may be infiltrated, and may be raised slightly from, or on a level with, the adjacent tissues. At times they appear as lardaceous deposits in the skin, whitish, reddish, or even blackish in color, with a telangiectasic border. These patches are usually at first hyperæsthetic, but finally they become insensitive, so that a lancet can be thrust deeply into them without producing the slightest sensation.

The pigment-variations in macular lepra are noticeable. At times a distinctly anæsthetic patch may readily be limited by its lack of sensation and of normal color; at other times either symptom may fail to correspond with the area of involvement defined by the other. Thus, a palm- to platter-sized, texturally unaltered area over the thigh or the belly may suggest a vitiligo by its relatively slight pigmentation and its distinct contour, beyond which are sepia to deep chocolate tints, gradually fading toward some adjacent and similarly involved patch. Yet this area will often differ materially from that of vitiligo in other respects.

Every point of the former may be totally insensitive to the prick of the lancet, and, moreover, be of a dull, tawny, yellowish, or parchment-like hue, never having the peculiar milky-white tinge of vitiligo. Again, this anæsthesia may extend widely beyond the line traced by the pigment-anomaly, or even within the latter may vary, islets of skin capable of perceiving sensations being in cases here and there discernible. The regions chiefly affected are: the back, the exposed parts, the backs of the hands and wrists, the forehead, cheeks, ears, dorsum of feet, and ankles. The eruption may be scanty or general; conspicuous, or so insignificant as to escape attention save when closely scrutinized. A few bullæ may be intermingled with the macules, the skin otherwise being texturally unaltered. The eruptive symptoms are associated commonly, early or late, with the graver phenomena described below.

Lepra Anæsthetica (*Lepra Trophoneurotica*, *Nerve-leprosy*, *Atrophic Leprosy*).—There may be one or two years of ill-health preceding the development of this form of lepra, the patient suffering from chills and vague sensations of malaise. Usually at this time the skin becomes hyperæsthetic in localized patches, sometimes generally; and special nerves in consequence of their enlargement become accessible to the touch. Those especially named below become tender and the seat of lancinating or shooting pains. This clinical variety, as has been described, may be commingled in its symptoms with each of the other types. With and without such commingling, however, there commonly is noted after exposure to cold, or after being subject to chills first an eruption of erythematous patches or of bullæ, bean- to large-nut-sized, with a roof-wall constituted of the entire thickness

of the epidermis, filled with a clear-tinted or blood-mixed serum, occurring usually upon the extremities. The cicatrices which follow these bullæ are atrophic patches, each often far greater in extent than the base of the original bleb, whitish, shining, glazed, or better described as of a tint suggesting the hue of mica; circular in outline, forming also the dumb-bell figure by coalescence or juxtaposition. These cicatrices are always anæsthetic, and they may coexist with macular and anæsthetic patches upon the trunk or other portions of the body: face, hands, feet, ankles, thighs—rarely the palms and soles. Neither those of the one class nor of the other, however, are disposed

FIG. 214.



Anæsthetic leprosy with mutilating results. (From a photograph of a leper in the Sandwich Islands.)

over the surface of the body in lines, bands, or curves corresponding with the distribution of the cutaneous nerves. Asymmetry is the rule. Occasionally, however, the ulnar and other nerves (median, posterior tibial, peroneal, facial, and radial) accessible to the touch are tumid, tender, insensitive, or as rigid as indurated cords; fusi-

form, reddish-gray swellings may be recognized with the naked eye along the nerve-tract, of translucent and gelatinous aspect. General atrophic cutaneous symptoms follow: the skin becomes dry and harsh; there is manifestly little or no sebaceous product; the sweat is scanty; the muscles atrophy; the hairs fall; the lymphatic ganglia enlarge; the skin of the face seems tightly stretched over the bones. As a result of deforming atrophy of the eyelids epiphora and consequent orbicular changes ensue and the parted lips permit constant escape of saliva. The fingers are half-drawn into the palm of the hand; the nails are distorted, and, later, ulceration occurs (Fig. 214).

The ulcers are irregular, oval, roundish, linear; covered with thin, blackish, flattened, tenacious, rarely rupioid, crusts; their bases are soft; their floors covered with a pultaceous débris often mixed with blood; the whole usually insensitive to every foreign body and external application. Lastly, the symptoms of *lepra mutilans* may occur, digits, or portions of the carpus, metacarpus, or corresponding parts of the foot, being detached from the body.

Death may ensue, at any time during the course of the disease, from septicæmia, exhaustion, or any of the intercurrent affections to which a patient in such a condition is particularly disposed. Thus, a leper was accidentally choked to death in San Francisco by some perversion of the function of deglutition. The disease, however, in the anæsthetic form is said to last from eighteen to twenty years, and is thus less rapidly fatal than the tubercular variety.

Considering the several clinical varieties of leprosy named above, and the mixed forms resulting from a commingling in some cases of the features of all varieties, the result is merely an analysis of the symptoms in an enormous clinical field. There are not, in fact, any forms or varieties of this disorder; there is but one disease, which exhibits itself in widely differing manifestations, and these at one time and in one country assume a predominant phase, while with a different environment and in another race other phenomena appear. Thus, *lepra tuberosa* is reported in from 50 to 75 per cent. of patients affected with the disease in the north of Europe, and in from 10 to 20 per cent. of those in tropical countries; while anæsthetic lepra in the geographical limits last named, is represented by two-thirds of patients, and in the northern latitudes by less than one-third. "Mixed forms" are less often reported than others, but as a matter of fact are the more often observed. The reason for this apparent discrepancy lies in the fact that really pure cases of any form are rare. It is best to look upon the expressions of lepra as it is accepted to regard the phenomena of syphilis: in each there is a single morbid principle; there are in both no true varieties; and the external symptoms differ chiefly because of special accidents of environment, of race, or of individual peculiarities.

Looking at the variant symptoms of lepra, a wide range occurs in all stages. In the evolution of the disease there is a usual order of fever, eruptive symptoms, and ulcerative or destructive sequels. In

the prodromic period there are often chilliness, profuse diaphoresis, insomnia, inappetence, diarrhœa, vertigo, and even a bullous efflorescence upon the surface. These prodromata are rarely wanting, and, after lasting for weeks, months, or years, are followed by sensations of chilliness, with remitting or intermitting febrile symptoms, the temperature rising from 100° to 105° F. The tongue becomes of a reddish hue, the listlessness and sluggishness continue, and the typical cutaneous lesions of the disease (leprous spots) appear, commonly on some portions of the face, with or without œdema. In some cases the prodromic symptoms and fever and chilliness are either absent or, what is more probable, are unnoticed, and then the disease may be first recognized by pains of a lancinating character, tenderness, and aching, especially along the course of the ulnar, peroneal, median, saphenous, or other nerves; or the result may be hyperæsthesia, anæsthesia, or pricking, tingling, and similar sensations in regions supplied by special nerves. The greatest variation is observed in the length of time during which these early symptoms, with more or less vagueness of expression, exist. Later, tubercles, nodules, bullæ, macules, hyperæsthetic and anæsthetic patches appear with gradual development of other and non-cutaneous symptoms, paralysis, exaggerated tendon-reflexes, and atheromatous papules upon the palpebral membranes and cornea. At times there results an ulcerative keratitis. In every large leper-hospital the number of inmates, both men and women, who have become totally blind in consequence of the ravages of the disease, is considerable. In many, too, nodules appear over the chest, genital regions, and extremities, as well as upon the mucous surfaces of the mouth and respiratory tract. The voice becomes raucous, while recrudescences of the disease occur either along the one (tubercular) or the other (anæsthetic) line toward the final stages of degeneration and mutilation.

The disease is seen in all typical forms, even in regions where leprosy is least prevalent. There may be a genuine leprous pachydermia with enormous increase in the volume of the hands and feet, accompanied by severe onychia and paronychia, and deep ulcerations about the nails. In some cases tumefaction of an entire limb results, strongly resembling an elephantiasis. The nose may be stuffed with leprous tubercles; and a large number of cutaneous symptoms of the most varying type develop in and upon the leprous skin as the result of secondary infection, of accidents, or of invasion by pus-cocci, etc., for it must be remembered that in most cases the leprous belong to the filthy and impoverished classes of society. Thus, there are often developed eczemas, erythematous, achromic and hyperchromic spots and disks, annular lesions resembling those seen in syphilis, bullæ rapidly becoming gangrenous (*erythème polymorphe lépreux bulleux et escharotique*, of Leloir), nodules of the usual size and hue of those in lepra (pinhead- to nut-sized, pigmented, reddish brown, copper tinted, glazed, shining as if oiled), and enormous infiltrations within and below the derma, even the production of large tumors of leprous tissue.

The generative apparatus may seriously be involved, the uterus, Fallopian tubes, and ovaries being the seat of leprous nodules or diffuse lepromatous infiltrations; as may be also the testicles, prostate gland, and penis. The breasts are also stuffed with tubercles; but they, as also the other organs named, may simply waste under the influence of the disease. Sexual power is retained longer than is commonly believed. In the colored races the eruptive symptoms are tinted in yellowish and reddish shades, a result due to contrast with the hue of pigmented skins.

Etiology.—Leprosy is a contagious and infectious parasitic disorder produced by the *bacillus lepræ*. This organism was discovered by Armauer Hansen in 1874, and is present in large numbers in tubercular forms of the disease, being relatively absent in anæsthetic lepra. It strongly resembles the bacillus of tuberculosis. These bacilli have been found in the dwellings and clothing of lepers as well as in the dust of apartments occupied by victims of the disease.

Secretions of a leprous patient containing bacilli or their spores are the usual vehicle by which the disease is transmitted. The question of the inheritance of leprosy may be regarded to-day as in much the same position as that relating to the inheritance of tuberculosis; no fœtus, no newborn living child has been known to exhibit the symptoms of either disease. Tonkin,¹ in an analysis made by him of 220 cases of leprosy observed in Sudan, states that the spread of the disease is not even remotely affected by any such process. Babes, however, cites several cases where infants but a few weeks old exhibited symptoms of leprosy. Men are affected with the disease more often than women. Infection is more common after the second decade, though children are occasionally among its victims.

The geographical distribution of leprosy is widely extended. In countries where it has not previously existed its appearance is due invariably to the infection of sound individuals by lepers first exhibiting symptoms where the disease is prevalent. Neisser formulates the law of its prevalence by stating that the number of lepers in any country bears an inverse ratio to the laws executed for the care and isolation of infected persons.

With a wide geographical distribution, the disease exists endemically in certain countries, and also in certain regions of the same country, with greater frequency than in others. All attempts, however, to connect its origin with malaria, with a residence near inundated sea-marshes, with the ingestion of a diet consisting largely of fish, or of a diet from which salt largely has been excluded, have failed of recognized success. The disease, however, seems to spread more rapidly in damp and cold, or warm and moist climates than in temperate countries. It is true that probably the larger number of all living lepers are those who have been poorly fed and otherwise subjected to the most insalubrious of influences, but the disease also attacks, though far more rarely, persons whose social position and

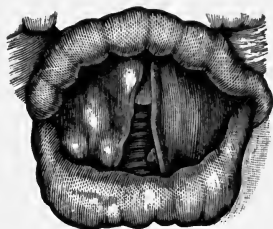
¹ Lancet, April 18, 1903.

hygienic surroundings are of the best. It occurs in both sexes—though more frequently in men—and at all ages; and, despite all effort to show the contrary, bears no relation to syphilis. Lepers, however, become syphilitic if infected with that disease, precisely as they may and do acquire variola, varicella, morbilli, erysipelas, and phthisis. The Hebrew Scriptures are often interpreted as showing that the disease among the Jews in Palestine was regarded by them as contagious and so treated. The modern student of these writings will, however, be convinced that this interpretation is erroneous. The leprosy of the book of Leviticus not only includes lepra, as that term is understood to-day, but also psoriasis, scabies, and other cutaneous affections. The leper, in the eye of the Mosaic law, was ceremonially unclean, and capable of communicating only a ceremonial uncleanness. Several of the narratives contained in these books bear witness to the fact that the Oriental leper was occasionally seen doing service in the courts of kings and even in personal communication and contact with officers of high rank.

Pathology.—The bacillus of leprosy is a delicate, rod-shaped, straight, or slightly curved parasite from one-half to three-fourths of the diameter of a red blood-corpuscle in length, and about one-fifth as broad as long. It often is pointed at one extremity. The bacilli of leprosy are morphologically almost identical with those of tuberculosis, but are found in affected tissues in vastly greater numbers, appearing usually in clumps, and responding more promptly to staining and decolorizing agents. These microorganisms have been found in nearly all the tissues of the body, and especially in the skin, mucous membranes, interstitial tissue of the peripheral nerves, in the cartilages, cornea, spleen, liver, lymphatic glands, sebaceous glands, and hair-follicles, also less abundantly in the testicles, spermatic cords, ovaries, and walls of the blood-vessels. They do not occur in the muscles, spinal cord, bones, or joints, and are wanting in many secondary inflammatory lesions, such as bullæ on the surface of the skin. They are rarely found in the epidermis, and though it is claimed that they are visible in the blood, their discovery in that fluid has been effected rarely. The bacilli are not found in physiological secretions unless these be pathologically altered by an organ or membrane affected with leprous infiltration. They have never been found in urine or in menstrual blood.

The parasites are most numerous in comparatively recent but fully developed nodes of the skin. Such a node on section shows in the centre a brownish mass or "globus," which sometimes can be shaken out of the surrounding tissue, and which on examination proves to be composed almost entirely of masses of bacilli. Even in the diffuse

FIG. 215.



Larynx of a patient affected with lepra tuberosa. (Author's case.)

form of infiltration the bacilli are usually found in groups or masses, but they may be disseminated through the tissues. The bacilli are almost invariably situated within a "lepra-cell," or occasionally in endothelial cells of the vessels, or in white blood-corpuscles. Unna, Schaeffer, and others, have found the bacilli without the cells.

Unlike the bacilli of tuberculosis, those of leprosy are cultivated on artificial media only with difficulty; the results, according to Scholtz and Klingmueller, being always clouded with doubt. Cam-

Fig. 216.



Bacilli of leprosy: a, epithelial scale. About $\times 1200$. (Author's patient.)

pana and Ducrey have shown cultures on blood-serum; and Emileweil claims to have accomplished the same result with egg-agar. Efforts to inoculate the lower animals with leprosy tissue have met with almost equal failure. Nicolle, however, claims to have recognized lepra-bacilli in mono-nuclear leucocytes from lesions removed sixty days after inoculation with lepra, of the *Macacus simicus*. Attempts to inoculate human subjects with the disease have resulted in but one apparent success; but in this case (that of a condemned criminal) though the disease actually developed later the results were incon-

clusive for the reason that the man was found to have been a member of a leprosy family.

Introduction into living tissues of leprosy material containing bacilli results simply in a local inflammation such as would be produced by the introduction of any inert substance. In such experiments the leprosy tissue which had been hardened for months in alcohol, was equally effective with the fresh tissue. Besnier and others believe that the bacilli die with the tissue in which they have lived, and thus account for the failure of culture- and inoculation-experiments. The slight viability of the bacilli is largely responsible for the usual benignity and slow progress of the disease.

In tubercular leprosy the chief histological changes are seen in the corium, the nodule being made up chiefly of granulation-tissue similar to that seen in lupus and syphilis; but the leprosy tissue is less vascular and consequently undergoes formative and retrogressive changes less rapidly; the cells are larger than in the two other diseases named, and do not form nests, as in lupus. The cells, which probably originate in endothelial cells of the vessels or in migrated cells, are seen in varying sizes and usually filled with bacilli to form the "lepra-cells." Giant-cells are also seen.

The infiltration may be diffuse as well as nodular, and is most marked at first about the vessels, glands, and follicles. Later it may

obliterate the papillæ and their line of union with the rete, and extend to the subcutaneous tissue. The external and middle coats of the vessels are infiltrated and thickened and their lumen narrowed. The sebaceous and coil-glands and the follicles are involved early, at first undergoing infiltration and hyperplasia, later degenerating and disappearing. The epidermis is involved secondarily only, and may be thus thinned and atrophied or broken in the formation of ulcers.

In macular and anæsthetic leprosy Hansen and Looft state that "the macules are, like the nodules, leprous infiltrations of the cutis, consisting of round, epithelioid and spindle-cells, the latter being more numerous the greater the age of the macule. These infiltrations appear to proceed from the vessels. *Lepra-bacilli* are always present, but are most numerous in the younger macules. In the young not as yet anæsthetic macules the nerve-twigs appear unchanged; in the older ones they are usually affected." The essential nerve-changes are an infiltration of cells containing bacilli within the external sheath and between the nerve-fibres, resulting in a gradual disappearance of the latter as a result of pressure produced by the great increase of interstitial connective tissue. The irritation of the nerve-fibres in the early stages accounts for the pains and hyperæsthesia; the nerve is also increased in size, often to a marked degree. Later there are atrophy and shrinking of the nerve, of which many of the original fibres have been destroyed and replaced by connective tissue, with resulting anaesthesia. The peripheral nerves are thus frequently affected, but in the brain and cord leprous changes have not been demonstrated. In a few cases of anæsthetic leprosy degeneration and atrophy of the posterior columns, posterior roots, and spinal ganglia have been demonstrated, as well as other changes probably due to an associated tuberculosis which is not infrequently present.

Regarding the disappearance of leprous lesions and tissue, Hansen and Looft report that in both the nodular and the maculo-anæsthetic forms "the bacilli in the leprous products break up into granules which finally disappear, and there remains of the leprous products only a scar in which nothing leprous can be recognized. Occasionally this takes place in all the affected parts, and there remains only a widespread anaesthesia, the result of the nerve-affection; and in the maculo-anæsthetic form this is the regular termination of the disease. In both cases the leprosy is completely healed." Jeanselme¹ concludes that after complete invasion of the subject the bacilli of lepra may utterly disappear, leaving only a sclerosis in their track.

Diagnosis.—Apart from the history, present and previous places of residence of the subject of the disease, and the clinical symptoms exhibited, the diagnosis of lepra is to be established by the presence of lepra-bacilli. These organisms may be recognized in the tissues, in serum obtained from involved regions, in blood made to exude from lepromatous nodules, in nasal discharges, and in the secretions of ulcers. Spronck asserts that the agglutinating power of the serum of

¹ *La Presse méd.*, 1900, ii., pp. 375 and 388.

the leprous produces a characteristic reaction in the bacilli reproduced by cultures obtained by Hansen's method.

In well-marked cases the recognition of leprosy is simple. In its prodromic periods no suspicion of its existence would be awakened in countries where the disease is not endemic.

From syphilis, which is also a disorder the lesions of which are polymorphic in character, lepra can be distinguished by its much greater chronicity; its larger and brownish-yellow, glazed tubercles; its frequent paræsthetic and anæsthetic symptoms; its bullous lesions, rare in acquired syphilis; the far more extended areas of its erythematous macules; its blackish crusts, lacking the rupioid aspect of those in syphilis; its leathery, mica-tinted cicatrices; and the characteristic leonine facies of its tubercular forms.

Morphœa and vitiligo are unattended by constitutional changes, and more particularly exhibit no hyperæsthetic nor anæsthetic symptoms in the affected patches. The atrophic and often deeply pigmented condition of the skin in the final stages of pityriasis rubra, associated with the emaciation and febrile condition of the patient, might for a time mislead the observer who had not a full history of the case. Multiple sarcomata, especially upon the face, are followed by much more rapid degeneration and a fatal result. All lesions of erythema multiforme can readily be distinguished from those of lepra by the absence of hyperæsthetic or of anæsthetic symptoms.

Syringomyelia is differentiated by its display of lesions only in regions where there is also muscular atrophy; by the much greater extent and lack of definition of areas of perturbed sensation; by diminution of the tendon-reflexes, which may be exaggerated in lepra; by a marked predominance of symptoms in the upper as distinguished from the lower extremities; and by the frequent presence of scoliosis. The nodules of lupus are not symmetrical, are far softer, and are much more often grouped than those of lepra. Further, they never have the size of the larger leprous tubercles, and never have the peculiar pigmented, brownish, and oiled or varnished aspect of leprous nodules.

Finally, the diagnosis of leprosy requires not only clinical symptoms, but also a definite contagion. Whether a history of transmission from one individual to another be or be not obtainable, it is certain that no person ever manifests leprous symptoms who has not been infected by some victim of the disease.

Treatment.—One of the most important considerations relative to the therapy of leprosy is that requiring the segregation and isolation of all lepers from contact with the uninfected. In some countries, those particularly where leprosy prevails, wholesome laws enforce this separation of the infected, and charitably provide also for the care of the wretched victims of the disease. In America, where leprosy, in consequence of its relative rarity, has not yet awakened the attention of legislators beyond the point of forbidding the entry of infected persons, the proper care of lepers in a community only too

ready to take alarm even at the name of the disease, is a serious matter. Many of the public hospitals for the care of the sick poor refuse to receive lepers. Leper homes have been established in Louisiana and Massachusetts. In several States of the Northwest the officers of health-boards are powerless to make proper provision for the care of a leper whose case is brought to their attention. In some of the American colonies provision is made for the care of lepers, as at Molokai in the Hawaiian Islands.

The child of a leprous woman should be removed from the mother after birth and not be given another woman's breast.

No remedies are known to have a directly curative effect in leprosy. As a consequence, the treatment of the disease is that suggested to the intelligent practitioner by the indications in each case. Most important, when the patient happens to reside in a district where the disease prevails, is change of residence and climate; the adoption of a highly nutritious diet; and the exhibition of roborant remedies, including steel, quinine, cod-liver oil, and often the moderate use of wines and malt liquors.

We have employed radio-therapy in the case of several leprous patients with success in the alleviation of local symptoms. Wilkinson also reports satisfactory results from the same measures in twelve reported cases, three having been scheduled as "cured" and seven as "improved." Lesions at a distance from those actually exposed to the ray exhibited improvement.

Chaulmoogra oil, which is obtained from the seeds of *Gynocardia odorata*, has the highest reputation in the treatment of leprosy. It is given in milk, in emulsion, or in capsule, in doses varying from a few minims to 200 and even 500 in twenty-four hours. Crocker and Dubreuilh report instances of a cure after this treatment.

Gynocardic acid (its active principle) is administered as a salt in combination with either sodium or magnesium, in doses of $\frac{1}{2}$ to 3 grains (0.033 to .2). The oil has also been injected subcutaneously, 5 grammes (75 grains) daily. Strychnine is added to the oil with advantage in some cases. In the case of a number of lepers who were treated by us with chaulmoogra oil, marked benefit was noticeable in the course of a few months. Gurjun oil, obtained from *Dipterocarpus laevis*, emulsified, 1 part with 3 parts of lime-water, is also given in $\frac{1}{2}$ ounce (15.) doses twice daily. Frictions with both oils are useful with the administration of ichthyol, 2 drachms (8 grammes) taken internally in twenty-four hours.

While the internal administration of mercury by the mouth has not been found useful, Crocker recommends injections of the bichloride of mercury, $\frac{1}{4}$ grain (0.016) to 20 minims of water, in the buttock twice weekly.

Diesling in several papers has enthusiastically advocated daily subcutaneous injections for six weeks of a thirty per cent. emulsion of iodoform in olive oil, from two to eight centigrammes being employed.

The injection of antivenene, the Carrasquilla serum, and other modes of serum-therapy have not been followed by results confirmed by experience. The cinchonas and salicylates are indicated in febrile conditions. Mercury, quinine, arsenic, cod-liver oil, strychnine, the iodine compounds, hoang-nan in pills of 3 grains (0.266); creosote in half-drop doses (0.033); the oil of cashew-nut, chrysarobin, pyrogallol, resorcin, 10 per cent. solution of salicylic acid in oleic acid (Arning), have all been employed with varying success by different practitioners; but an unprejudiced review of the maximum of results thus obtained establishes the conviction that no one of the remedies named may be regarded as exercising a controlling influence over the disease. Most of them have been employed by physicians sufficiently wise to enforce simultaneously the most generous tonic regimen, thus clouding with doubt a belief in the part played by the medicament in the production of the result.

D. W. Montgomery,¹ Ehlers,² Calenheim, Thin, and others have reported cases both of spontaneous cure of lepra and also cures of the disease by medication. One such instance was shown to me by Lie in Bergen.

Prognosis.—The future of the leper is in general dark. The disease is often malignant in character, and, however protracted, a fatal result has been the rule. Still, with a change of climate and improved hygienic conditions much has been accomplished. The Scandinavian lepers who have removed to the United States have been benefited greatly by the change. This was the opinion of the late Professor Boeck, who studied the history of leprous immigrants who had come to this country from Norway. He believed that the change in some cases would work a complete arrest of the disease. A careful study of the history of leprosy in America will induce the belief that such a favorable result can be anticipated after residence in this country. Cases of both maculo-anæsthetic and tubercular lepra, concluding with complete recovery are now sufficiently numerous to suggest that the prognosis of the malady in the future may be much more favorable.

Sartian Disease (*Taschkent-geschwur*) is an infectious granuloma, described by Heiman, and microscopically examined by Rudniew. It occurs in Taschkent, or Taschkend, a market-town of Asiatic Russia, west of the Caspian Sea. The disease affects the face, the upper extremities, and the trunk, avoiding always the palmar and plantar regions. Reddish macules develop into nodules, which desquamate, coalesce, degenerate, and leave crusted ulcers, which may cicatrize.

¹ Med. Rec., 1902.

² La Lèpre, 1901, ii., p. 15; *ibid.*, p. 53.

YAWS.¹

(FRAMBÆSIA TROPICA; PIAN; POLYPAPILLOMA TROPICUM; LEPRO FUNGIFERA; TOBE; BUBAS, BOUBA, OR BOBA; SCHWAMMFORMIGE; BOUTON D'AMBOINE; TONGA; COCO; FRAMOSI; TETIA; LUPANI; TOMO; PERUVIAN WART; PARANGI.)

Yaws is an infectious and contagious disorder existing as endemic in certain tropical countries and affecting chiefly individuals of the colored races.

Yaws was first given the name, *Frambæsia*, by Sauvages in 1759, and has since been recognized (under many colloquial terms a few only of which are given above) in Northern Africa, Algeria, Mozambique, Madagascar, and the Comoro Islands, Asia, Australasia, and the French and English West India Islands. It is possibly identical with the disease described in Scotland in the year 1694 under the title of "sibbens" or "sivvens."

Symptoms.—According to Castellani, whose description is for the most part followed in the ensuing paragraphs, a primary lesion, rarely genital in situation, first develops after an incubative period of from two to four weeks, consisting of papules, single or multiple, which soon become moist, secreting, and covered with a thick crust beneath which forms an ulcer with sharply defined edges, and a granulating floor. This ulcer may heal, leaving a whitish scar, or develop into a granulating tubercle ("mother yaw," "maman pian") about which may form satellites. The neighboring ganglia may enlarge and become indurated but do not break down. At times the sore is pruritic and painful. The site of the lesion is commonly extra-genital. The papule may develop from previously occurring traumatism (pustules from scabies, vaccination-wounds, insect-bites, etc.). In women, the mammary region and in men the extremities are frequent sites of the primary lesion, though it may develop on any part of the body. It may last from a few weeks to several months and may thus persist until the evolution of secondary symptoms.

The ensuing generalized eruption begins within one to three months after the evolution of the primary sore, and may be accompanied by malaise, headache, vague pains, and mild febrile symptoms. The lesions are then multiple, pin-head-sized, roundish, papules with a yellowish apex, capped often with a thin crust of corresponding hue. These lesions may enlarge to granulomatous nodules or tubercles with dark areola, the thin secretion from which

¹ Cf. Scheube, Faleke, and Cantlie, *Diseases of Warm Countries*, p. 290 (with bibliography); Manson, l. c., p. 566; Gerrard, *Jour. Trop. Med.*, 1906, Jan. 1; Wolley, *Amer. Med.*, 1904, p. 242 (with photomicrograph of section); MacLeod, *Brit. Med. Jour.*, 1907, Sept. 21; Castellani, *Brit. Med. Jour.*, 1907, Nov. 23, p. 154 (with cut showing spirochæte), *J. C. D.*, 1908, xxvi., p. 151 (12 plates); Beurmann and Gougerot, *Rev. de Méd.*, 1907, May 10; Neisser (experiments in apes), *München med. Woch.*, 1906, No. 28; Halberstaedter, *Kaiserlich. Gesundheits.*, 1907, Bd. xxvi., Heft 1.

desiccates to a crust. Later, the lesions may dry into keratotic, firm papules which eventually shrivel, disappear, and leave at the site of each, deeply pigmented spots. They may last for months, may become pruritic, and may be associated with scaly and ulcerative patches, with granulating or irregularly outlined, nutmeg-grater-like areas of a whitish tint, or with papules exhibiting a central plug suggesting lichen spinulosus. Painful lesions occur on the palms and soles. The odor arising from the patient is offensive.

A striking resemblance to some phases of syphilis is presented when, in the palmar regions, firm, roundish, flattened papules having a dense central epidermic plug, exhibit characteristic pits when the central plug is shed or removed.

Alopecia occurs only in narrow areas where granulomatous changes have destroyed the follicles; in rare cases the lesions invade the mucous surfaces where whitish patches develop. Fever when present is of sympathetic type merely; firm, painless, cervical and inguinal glands may enlarge but do not break down unless secondarily infected. Osteo-periostitis, muscular contracture, hyperhidrosis, and chloro-anæmia may occur.

A tertiary stage may be wholly absent, or, after some years, may follow the secondary phenomena described above, gummatous nodules invading the skin and subcutaneous structures, breaking down into ulcers with clean-cut edges and a sloughy floor. The resulting scars are whitish in hue and correspond in outline to the preëxisting ulcers. The scars are often disfiguring and contracted.

Etiology and Histopathology.—Castellani has shown that yaws is produced by the *spirochæta pertenuis*, a delicate, motile, spiral-shaped organism, 18 to 20 microns in length, which has been stained by both the Leishman and Giemsa methods. The organism may exhibit 6 to 20 or more spirals, the extremities being usually pointed, occasionally pyriform. No undulating membrane has been recognized. Both Castellani and Neisser have demonstrated that monkeys inoculated with yaws are not immune against syphilis and vice versa; though Neisser is not in agreement with Castellani as to the proof that yaws is actually a treponemosis.

The cutaneous tumors of yaws are granulomata composed of round and spindle-shaped elements in a vascular network of connective-tissue-cells, a plasma-cell infiltration of the skin, where the papillæ are elongated, and whose vessels are dilated. In advanced cases there is hyperkeratosis. Castellani has noted the large number of polychromatic red blood-cells of different sizes in films stained by the Leishman method. He interprets the roundish or oval rather deeply stained bodies recognizable in the protoplasm and nuclei of leucocytes, as polychromatic micro-erythrocytes engulfed by phagocytes.

Diagnosis.—The distinction between frambæsia and psoriasis and eczema is readily effected by consideration of the distinctive peculiarities of the several disorders named. It is chiefly the distinction

from syphilis that has engendered confusion in the past. The following are important points of distinction: syphilis often, yaws rarely, attacks the mucous surfaces, the last-named disease much more rarely involving the lymphatic glands; there is usually itching in the yaws eruption; there is no characteristic copper color in its eruptive features; yaws does not affect the bones save in the continuity of long-standing ulceration of the skin; the subject of yaws is susceptible to indefinite autoinoculation; yaws though common in children is not inherited; healthy parents may have infants seriously affected with frambesia; lastly, the two diseases often concur in the same person.

Treatment.—The disease yields readily in the simpler cases to mild parasitocides; in severe cases tonics are required internally, such as iron, quinine, and strychnine.

Prognosis.—The prognosis is favorable save in infants and broken-down subjects of other maladies.

VERRUGA PERUANA.¹

(Sp., *Verruga*, wart.)

(PERUVIAN WART, OROYA FEVER, CARRION'S DISEASE.)

Verruga Peruana was described first in the sixteenth century by Zarate, of Lima, in his *History of the Conquest of Peru* (1543). J. J. Tschudi, in 1845 (*vide infra*), contributed the first scientific observation of the disease. It is a malady formerly widely distributed in certain of the valleys of the Andes in Peru, at an elevation of from 3000 to 10,000 feet above the sea-level, the wind-protected gorges being endemically affected, though at present somewhat less severely attacked. The disease is supposed to have been observed also in Ecuador, Bolivia, and Chile. Stelwagon has treated one case in Philadelphia.

Symptoms.—The disease is ushered in with severe rheumatoid pains and fever, lasting for weeks or months, the latter often intermitting, producing grave anæmia, and accompanied by splenic and hepatic changes. Often there are evidences of profound prostration with symptoms strongly suggestive of "congestive chills" in tropical and malarial districts. In grave cases there may be a fatal issue before the development of cutaneous symptoms.

The skin-manifestations, sparse or numerous, discrete or confluent, may appear on subsidence of the constitutional disturbance, though

¹ Cf. Chastaing, Arch. de Méd. naval., Dec., 1897, p. 417; Firth, Allbutt's System, vol. ii., p. 496; Letulle, Compte Rend. de la Soc. biol., 1898, xv., p. 764; Morrow's System, vol. iii., p. 694; Nicolle, Ann. de l'Inst. Past., 1898, xii., p. 591; E. Obriozola, La Maladie de Carrion, ou la Verruga Peruv. Paris, 1898; Manson, p. 580; Scheube, Diseases of Warm Countries, p. 298 (bibliography); Ramirez del Villar, Inaug. Diss., Berlin, 1895; Ruge, Berlin. klin. Wehenschrft., 1897, p. 1005; Stelwagon, Diseases of the Skin, p. 793; Tschudi, Arch. f. phys. Heilk., 1845, p. 378; Oesterreich. med. Wehenschrft., 1846, p. 505, and Wien. med. Wehenschrft., 1872, p. 240; Godas, G., Cron. Med. Lima, 1907, xxiv., 225, 241, 264.

the latter may recur after the exanthem develops. At first the lesions are slightly elevated, pinkish or reddish macules, which later assume a dusky bluish-red hue. From these spring conical, hemi-globoid elevations (warts) varying in size from that of peas to that of beans, developing later into pigeon's egg-sized, softish or elastic, smooth, shining, and often hemorrhagic elevations. Variations occur, when vesico-pustules and even large blebs form. On the summit the thinned epidermis commonly cracks; the fissured apices later produce fungiform excrescences. The lesions may vary in number from one or a few to thousands, covering the entire body-surface, though the parts chiefly invaded are the face (especially the forehead, superciliary arch, eyelids, cheeks, nose, ears), the neck, and the extensor faces of the limbs, especially near the articulations. The palms, soles, and scalp are invaded more rarely, the trunk still more rarely. The lesions may be subcutaneous; they may involve the mucous surfaces, and even the viscera. Abortive eruptive phenomena have been noted in cases. In some instances there is distinct confluence of lesions; deep ulcerations eventually may furnish a fetid discharge, or be the seat of abundant hemorrhage. In such event the lesions are transformed into malignant-looking grayish or blackish spongy masses, covered with brownish crusts and exhaling a putrescent fœtor.

Etiology.—The disease is transmissible by inoculation, as evidenced in the case of the physician Carrion, who after self-inoculation in both arms from the blood of a patient, perished in fifteen days. The name added to the list of titles given above, is a memorial of this self-sacrifice. The disease attacks persons of both sexes and all ages, including newborn infants. Persons working in the earth are especially liable to contract the disorder, which seems further to be aggravated in conditions of moisture and warmth. Malaria is a well nigh invariable correlative of the affection. Manson believes that the hæmorrhagic features of the cutaneous lesions may be attributable in part to the rarity of the atmosphere in the regions where the malady exists.

Pathology.—The pathology of the disease is that of a granuloma, similar in many points to the granuloma of yaws.

Treatment.—The treatment requires removal to a climate where the disease is not endemic: and includes firm compression of all hæmorrhagic lesions.

Prognosis.—The disease may run its course in a few days or be prolonged for weeks or even months. One attack seems to confer immunity against a second. The rarer complications of the general condition are intestinal hemorrhages, hæmaturia, metrorrhagia, hæmoptysis, epileptiform convulsions, and meningitis. In favorable cases the eruptive elements shrivel and scale, and become the seat of varying degrees of pruritus which may be excessively severe.

ULCERATING GRANULOMA OF THE PUDENDA.¹

(SERPIGINOUS ULCERATION OF THE GENITALS, GROIN ULCERATION, SCLEROTIZING GRANULOMA OF THE PUDENDA, PERFORATING GRANULOMA OF THE THIGH, GRANULOMA INGUINALE TROPICUM. *Ger.*, DAS VENERISCHE GRANULOM.)

In 1896 Conyers and Daniels first recorded observations of this disease in negroes resident in British Guiana and among East Indians. The malady has since been observed among the natives of the Fiji and Solomon Islands and the New Hebrides. Contributions to the subject have been made by Maitland, MacLeod, Manson, and others.

Symptoms.—The disease occurs in both sexes after the puberal epoch, chiefly in women, and is seen most often in the genital region and the parts provided with long hairs, but it has been observed on the cheek, the lips, and inside the mouth. The lesions are vivid-hued, shining, verrucous, vegetating nodules of granulation-tissue. These are at first circumscribed thickenings and elevations. The thin overlying epidermis is excoriated readily, and exposes a hemorrhagic surface which may ulcerate. The granuloma spreads both by auto-infection and peripheral extension, producing eventually, possibly after years of slow extension, a dense, contracting, irregularly nodulated scar-tissue, here and there sprinkled with islets of actively progressing disease. Unevenly pigmented areas are made up of excoriated or partly cicatrized and corded tissue, often with a narrow, serpiginous, elevated, glazed, pinkish or reddish border. The process is superficial and as a rule unaccompanied by coincident adenopathy.

The parts most often invaded are the labia and vagina of women; in men the penis, urethra, and scrotum; in both sexes the ano-rectal region, pubes, groins, and rarely the bladder. Subjective sensations are not conspicuous; anæmia and cachexia occasionally result. Offensive discharges are produced in advanced cases. The disease is aggravated in regions of pressure, friction, and moisture. Manson describes the affected surface as "an area of white or irregularly pigmented, perhaps excoriated, contracting, folded, and dense cicatrix, surrounded by a narrow, serpiginous, irregular border of nodulated, somewhat raised, red, glazed, delicately skinned or pinkish, superficially ulcerated or cracked new-growth."

Etiology.—The disease attacks persons of all races, but chiefly negroes; and individuals of both sexes, but mostly women. The subjects are as a rule young adults, though the disease is seen in aged persons. The affection is contagious, autoinoculable, and frequently

¹ Bibliography: Conyers and Daniels, *Brit. Guiana Med. Ann.*, 1896, viii., p. 13. Crocker, *Diseases of the Skin*, p. 1076; J. C. D., 1908, p. 61. Daniels, *Brit. Guiana Med. Ann.*, 1898, x., p. 49. Fowler, *ibid.*, 1899, xi., p. 22. Galloway, B. J. D., 1897, ix., p. 133. K. MacLeod, *Jour. of Trop. Med.*, 1899, p. 175. J. Maitland, *Lancet*, 1899, ii., p. 1624. Manson, *loc. cit.*, p. 471. A. Powell, *Ind. Med. Gaz.*, 1899, p. 187. Scheube, Falcke, Cantlie, *loc. cit.*, p. 54. Sequeira, *Brit. Med. Jour.*, 1908, March 7.

venereal in origin though not syphilitic. The precise character of its virus is unknown.

Pathology.—According to Galloway, the lesions are tumors of infectious granulation-tissue, which begin with a small-cell (plasma-cell) infiltration of the papillary layer of the corium and of elongated rete-pegs which crowd before them as they advance, the fibres of the corium. The overlying epidermis is thinned or absent; the vessels dilated; the granular tissue not greatly altered. No caseation occurs, and no giant-cells are seen. Donovan (cited by Manson) has recognized in scrapings from the lesions, a gigantic short bacillus, 1 by 2μ , with rounded extremities, abundant in mononuclear leucocytes.

Diagnosis.—The disease is to be differentiated from syphilis by the absence of adenopathy, by the extreme chronicity of the process (at times extending over ten years with but few changes), and by the special features outlined above. It is not amenable to antisymphilitic treatment.

The **Treatment** is by excision, which Manson prefers on account of the marked tendency to recurrence in many cases. Curettage and subsequent cauterization have been successful. Mercury and iodine salts are of little if any value. Radiotherapy has been employed with success.

ORIENTAL SORE.¹

(MYCOSIS CUTIS CHRONICA, LUPUS ENDEMICUS, ALEPPO EVIL, BISKRA BOUTON, DELHI BOIL, ORIENTAL BUTTON, ORIENTAL ULCER, GAFSA BUTTON, AFGHAN PLAGUE, TASCHKAT ULCER, NATAL SORE. *Fr.*, BOUTON D'ORIENT, CHANCRE DU SAHARA, CLOU DE BISKRA; *Ger.*, ENDEMISCHE BEULENKRANKHEIT.)

The morbid condition known as Oriental Sore is one designated not merely by the synonyms detailed above, but by a series of names in the Arabic, Turkish, Persian, and Russian languages which in most instances refer to the same disease. It is an endemic cutaneous affection, recognized chiefly in tropical and subtropical countries, more particularly in those which have given titles to the disease, such as Biskra, Gafsa, Aleppo, Bagdad, Delhi, etc. It occurs in Morocco, Algiers, Tunis, Egypt, Crete, Cyprus, the Crimea, Syria, Mesopotamia, Arabia, Persia, Turkestan, India, Brazil and probably other portions of South America.

Symptoms.—The disease begins after an incubation period of days or months as a circumscribed pruritic maculo-papule having a firm,

¹ Scheube, Faleke, Cantlie, *Diseases of Warm Countries*, Phila., 1903, p. 534; Manson, p. 589, Brault, *Annales*, 1899, s. iii., x., p. 85 and p. 226; Brocq et Veillon, *ibid.*, 1897, s. iii., viii., p. 553; Doulas, *Jour. Mal. cutan.*, 1903, s. vi., xv., p. 190; Kuhn, Johanne, *Virehow's Archiv*, 1897, p. 372; Lemarsky, *Rev. internat. de Méd. et de Chir.*, 1897, viii., p. 78; Löwenhardt, *Rep. Trans. Germ. Assoc. of Surg.*, xxviii., Congr. 1899, p. 37; Morvan, *J. C. D.*, 1900, xviii., p. 230; Moty, *Annales*, 1893, s. iii., iv., p. 41, and 1897, s. iii., viii., p. 726; Riehe, *Vierteljahr.*, 1886, xiii., p. 805; Unna, *Histopathology*, 1894, p. 472; Wright *J. C. D.*, 1904, xxii., p. 1; Nattan, Larrier, *J. A. M. A.*, 1907, Sept. 14, p. 972.

shot-like feel, starting from an hyperæmic and infiltrated portion of the skin. In the course of a few days furfuraceous scales cover the surface of a well-defined papule, which being agglutinated by the secretion from beneath of a thin fluid, form a yellowish-brown thick adherent crust. On the removal of this crust there is exposed beneath, a shallow ulcer which extends peripherally and exudes a secretion which tends to reproduce the crust, beneath which the ulcer spreads. Satellites in the form of new papules and ulcers form in the vicinity which often merge and produce a single, sharp-bordered, rounded or oval, punched-out ulcer with granulating floor, œdematous base, out-lying areola, and bulky crust. The dimensions of the sore vary from 8 to 12 or more centimetres in diameter. Repair after a period of from two to twelve or more months ensues by the usual processes of granulation and cicatrization. The resulting cicatrix is usually sunken, at first pigmented, and exceedingly deforming when, as is often the case, it is displayed upon the face.

The parts chiefly affected are the face, especially in young subjects, the hands, feet, arms, and legs; commonly the palms and soles, the scalp, and trunk are spared. In some cases the primary lesion does not proceed to ulceration; in yet other cases, instead of one there may be a dozen or even forty separate sores; the lesion, like all others, may be complicated by the epiphenomena of erysipelas, phagedæna, lymphangitis, abscess, phlebitis, etc. Relapses occur.

Etiology.—Oriental sore is contagious, auto-inoculable, and transmissible to and from the lower animals by direct contact or by the medium of insects, articles of clothing, etc. It affects indiscriminately persons of both sexes, of all ages and nationalities, those varying as to vigor and occupation. It often attacks children after the completion of the second year, and seems at times to confer a species of immunity against second attacks, though many instances tend to disprove the possibility of such protection. Those exposed may develop symptoms in the course of a fortnight; though in other cases it would seem that months may intervene before infection is established; briefly there is no fixed period of incubation.

Nicolle and Siere¹ report the transmission of oriental button from a man to an ape (*Macacus simicus*), lesions appearing twenty-four days after infection.

Pathology.—Parasites taking a violet stain were recognized by Cunningham and Firth. Wright, in the case of a female child nine years of age, born in Armenia, examined a tropical ulcer which was excised, and recognized in smear preparation round, well-defined bodies 2 to 4 μ in diameter, each containing a lilac-colored mass near the periphery of the body, which were present in large numbers and supposed to be protozoa (Leishman bodies). They were recognized as intercellular in situation, and multiplied by fission without spore-formation. Wright gave the name *helcosoma tropicum* to these

¹ Compt. rend. la sé. Soc. Biol., lxiv., 1908; abstr. Dermat. Centralb., 1908, xii., p. 17.

bodies, and believes them to differ from the organism recognized by Firth by reason of the characters described above. These observations have been confirmed by Nathan Larrier. He found the organisms in the blood and phagocytes, the macrophages disappearing later and replaced by lymphocytes. The disease is probably propagated by blood-sucking insects.

Sections made of primary papules reveal round-cell infiltration of the derma, the presence of multinuclear and giant-cells, and of leucocytes, the deposit being most plentiful about the vessels of the skin and the coil-glands. In the midst of the infiltration Unna has seen necrotic granules; the surviving hairs are altered in shape and sheath; rounded or oval cavities surround the hair-pouches; the blood-vessels may be obliterated by endothelial plugs.

Diagnosis.—The diagnosis in localities where the affection is endemic is attended with but little difficulty; but among the classes in which the disease is especially likely to be encountered, it is confounded most often with syphilis. The strictly local character of the oriental sore and the duration of that disease furnish ample facility for its distinction from other ulcers of a specific origin.

Treatment is by cauterization, excision, erasion, asepsis, and the methods employed by the resources of modern surgery in the management of similar affections. By many local authorities the milder and soothing rather than the more severe (destructive) measures of treatment are advocated. Continuous immersion should be employed in all severe cases.

Prognosis.—The prognosis is in general favorable, save in the matter of deformity left by the resulting scars. Crocker's patient after excision of the sore died of general sarcomatosis.

BUCHAREST BOIL.

Finkelstein¹ describes under this title a painful furuncular affection differing from the oriental sore, preceded by pain and beginning with an elevated nodule which in the course of two or three weeks, during which period there are accesses of fever, bursts and after discharging leaves a contracted cicatrix which may also be complicated with articular ankylosis. The abscess may be as large as a child's head, and commonly is situated either in the inguinal or lumbar region. The subjects of the disease are usually between eighteen and thirty-five years of age, suffer but little in the general health, and rarely perish of the affection, which is believed to originate in unsanitary conditions of living. Fränkel's pneumococci, the common streptococci, and staphylococci have been found in the pus. No malarial parasites have been recognized.

¹ Deutsch. med. Wochenschrft., 1899, cited by Scheube.

TROPICAL DISEASES OF UNCERTAIN NATURE.

PELLAGRA.¹(Lat., *pellis*, the skin; *æger*, diseased.)

(LOMBARDY ERYSIPELAS, LOMBARDY LEPROSY, RISIPOLA LOMBARDA, LEPRA ITALICA, LA ROSA, MAL ROXO, PELLARELLA, ALPINE SCURVY, DERMATAGRA.)

This is a chronic constitutional disorder prevailing as an endemic in various parts of Europe, Asia, Africa, and North America, characterized by gastro-intestinal, nervous, and other morbid symptoms, being also accompanied by an erythematous exanthem. The disease is recognized chiefly in Italy (Lombardy, Venice, Emetta), but occurs also in parts of Spain, France, Portugal, lower Egypt, and Mexico (Yucatan, Campeche). Sherwell has reported cases of the disease occurring in Italian sailors visiting New York City, and Seavey² reports cases of pellagra in Alabama. The medical officers of the South Carolina State Hospital and elsewhere, including those of the city of Chicago, have recognized the disease in patients under their care.

Symptoms.—The symptoms of pellagra differ to a marked degree in different subjects of the disease and in the different countries in which it is endemic. The course of the malady is essentially chronic, and is characterized by remissions and aggravations in recurrent attacks. There is commonly a prodromic stage, of longer or shorter duration, which may extend over several winters preceding the spring in which most often marked symptoms are declared. The subjects of the affection then experience languor, suffer from vague pains in various parts of the body, and are disinclined to labor by reason of bodily weakness. These recurrent evidences of ill health are followed by marked anorexia, thirst (often intolerable), or inappetence for both food and drink, abdominal pains, eructation of gas, and loose stools, often with bloody alvine evacuations. These signs of disorder are accompanied generally by nervous symptoms, including pains and tenderness of the head, vertigo, dizziness, marked asthenia, mental dejection and hebetude, with increase of the tendon-reflexes and inco-ordination of movements, more particularly of the lower extremities.

¹ Bibliography: Gemma, Ann. univ. di med., 1871, p. 564; Winternitz, Vierteljahr., 1876, iii., p. 151; Paltauf u. Heider, Der Bacillus Maidis (Caboni) und seine Beziehungen zur Pellagra, Vienna, 1889; Raymond, Annales, 1889, s. ii., x., p. 627; Pellizzi, u. Tivelli, Centralbl. f. Bakt. u. Parasit., 1894, xvi., p. 186; Carravoli, Giorn. della r. Soc. ital. d'igiene, 1896, Nos. 7-9; Lombroso, Die Lehre von der Pellagra, Berlin, 1898; Sandwith, B. J. D., 1898, x., p. 395, and Jour. Trop. Med., 1898, i., p. 63; Babes and Sion, "Pellagra," Nothnagel's Spec. Path. u. Therapie, xxiv., Pt. ii., fasc. iii., Vienna, 1901; Scheube, Falcke, and Cantlie, Diseases of Warm Countries, Philadelphia, 1903, p. 311; Ceni, Centralbl. f. Allg. Path. u. path. Anat., 1903, xiv., p. 465; Galli, Med. Wehnschrft., 1901, Nos. 34 u. 35 (abstr. Archiv, 1903, lxvii., p. 263); Verotti, Giorn. internat. d. Sc. Med., Napoli, 1903, xxv., p. 273; Stefanowitz, Wien. klin. Wehnschrft., 1903, xvi., p. 1089. Manson, l. c., p. 328.

² J. A. M. A., 1907, July 6, p. 37.

The cutaneous symptoms may be a marked feature of the disorder or be wholly lacking. The skin, especially of exposed regions, such as the face, neck, upper chest, backs of the hands, lower third of the forearms, dorsum of the feet, and in the case of persons who are almost entirely nude during the day, such as the Fellahs of Egypt, the entire body area becomes involved. The surface is then reddened

FIG. 217.



V. S., aged twelve years; acute pellagra; death in first attack.
(W. J. H. BELLAMY.)

in patches of irregular contour, tumid (toxic erythema), and either smooth or disclosing the usual signs of dermatitis (vesicles, blebs, pustules, crusts, etc.). As the subacute attack subsides usually in a fortnight, there follow desquamation, pigmentation, harshness of the surface, and the condition commonly following repeated attacks of dermatitis, the skin becoming shrunken, wrinkled, atrophic, and xerodermatous.

The other pronounced symptoms of pellagra are marked sensori-motor phenomena (muscular weakness, at times amounting to paralysis; tremor or tetanic contractions; paræsthetic diplopia, hemeralopia, melancholia, and imbecility). At times dementia follows. The

coördinate symptoms may be fever, in varying gradations of temperature, and marked circulatory changes.

In the final stages of the disease cachexia is induced and the patient falls into a condition of marasmus (*typhus pellagrosus*) with the usual signs of extreme weakness (involuntary defecation and urination, sordes on the teeth, intercurrent pneumonia, or other fatal complication).

Within a relatively brief period cases of pellagra have developed in America chiefly in the southern states, so far as known for the first time in the medical history of the country.¹ The cases have occurred in a somewhat acute type and almost in the form of an epidemic, with a mortality somewhat greater than that recognized in European cases. The history of this disorder in America would seem to indicate that Manson's disbelief in the origin of the disease should be accepted with reserve. The origin of some of the American cases has been distinctly traced to the consumption of maize producing a toxine after its storage.

The disease may recur annually and thus persist until the strength of the victim is exhausted for from two to ten or more years. An acute form (*pellagra typhus*) may give rise to high temperatures of the body, delirium, trismus, and opisthotonos.

Etiology and Pathology.—Pellagra has long been believed to arise from the consumption of damaged maize, but the arguments against this theory are both numerous and cogent, and are well set forth by Manson who details conditions cited as effective in maize supposed to have morbid effects. These are: deficiency in nutritive elements; toxic substances in normal grain; toxic substances supposed to be elaborated after its ingestion; substances produced during decomposition of the grain; and fungi or bacteria found upon it. Reviewing the entire question it appears that the efficient factor in the production of pellagra is at present unknown.

Persons of both sexes are prone to the disease after reaching adult years, infants being rarely attacked. The disorder is practically confined to field laborers, the Jews who are no longer an agricultural race, and urban populations in general, being largely exempt. It seems tolerably clear that insolation has some influence in its production, seeing that the exposed parts of the body especially in the months of the spring season, suffer extensively and this at recurrent seasons in low-lying districts of country with a high water-level.

Post-mortem there have been recognized: fatty and atrophic cardiac changes; brown atrophy and fatty degeneration of the liver; cirrhosis of the kidney; intestinal attenuation and ulceration; hyperæmia, anæmia, œdema of the brain, cord, and meninges, symmetrical

¹ J. A. M. A., 1908, Feb. 8, p. 459; Bellamy, *ibid.*, 1908, Aug. 1, p. 307; Lavinder, U. S. Public Health and Marine Hospital Service; Wash. Govt. Printing Office, 1908, with cut; W. W. Roy, *Amer. Jour. of Insanity*, Baltimore, 1907-8, lxiv., pp. 703-725; Thermeli, *Tr. Am. Derm. Ass.*, 1903, p. 76; Harris, *Am. Med.*, iv., p. 99 (Georgia case); Learey, *J. A. M. A.*, xlix., pp. 1, 37 (Alabama cases).

sclerosis of the cord; and, in typhoid cases, acute myelitis. The most constant and pronounced of these morbid conditions are symmetrical sclerosis of the posterior columns of the cord, corresponding with the track of the lateral pyramidal fasciculus.

Nicolas and Jambon¹ reviewing the literature of pellagra and its concomitant symptoms both in the skin and its mucous membranes, conclude that careful examination does not permit a precise clinical distinction between true pellagra which seems of late to have increased in frequency and the pseudo-cases given the same name. Improper food, psychological depression, poverty, and the general causes of malnutrition are effective perhaps to a greater extent than chemical changes which have thus far been recognized in the maize consumed, thus agreeing to a large extent with the conclusions of Manson.

Diagnosis.—As the cutaneous lesions are at times wholly absent, the recognition of the disease depends for the most part on the other morbid symptoms presented. The region in which an endemic influence is exerted is of importance in determining the character of any case.

Treatment.—The treatment is by prophylactic improvement of the hygienic and climatic conditions of the patient; quinine and tonics in cases of debility; proper management of nervous and gastric troubles; and, when practicable, a generous dietary. Lombroso recommends arsenic internally, and the tincture of *cocculus* (gtt. v-x) in the treatment of giddiness. The spinal symptoms are managed best by massage, electricity, and alcoholic or salt embrocations.

Prognosis.—The prognosis is favorable in some cases, which may be so mild as to be scarcely noticeable; in others it is grave; and in districts where the disease prevails extensively the mortality may be formidable.

CRAW-CRAW.²

(KRO-KRO, KRA-KRA. *Fr.*, PAPULOSE FILARIENNE.)

Craw-craw is a term employed by the natives of the West African coast for the designation of several diseases of the skin, including scabies, ringworm, *eczema*, and dermatites of various types, occurring among negroes. Most authors agree that great confusion prevails respecting the affection to which the name should strictly be limited.

O'Neil believes that the title includes a disorder attributable to the presence of a filariform parasite, pustules and papules similar to those found in scabies occurring in the regions affected. The filariæ found by him in the summit of scraped papules were from $\frac{1}{100}$ to

¹ *Annales*, 1908, s. iv., ix., p. 480; complete bibliography to date.

² Brault, *Annales*, 1899, s. iii., x., p. 226. Collineau, *Rev. Mens. de l'Ecole d'Anthropol.* de Paris, 1900, p. 84. J. Emily, *Arch. de Méd. naval.*, 1899, lxxi., p. 54. Manson, l. c., p. 794. Scheube, Falcke, and Cantlie, *Diseases of Warm Countries*, p. 522. O'Neil, *Lancet*, 1875, i., p. 265. Plehn, *Die Kamerun-Küste*, Berlin, 1898, pp. 286, *et seq.*

$\frac{1}{2000}$ of an inch in dimensions, with two black markings at the cephalic extremity. The eruptive symptoms declined when the subject of the disorder visited a cooler climate and returned when there were fresh exposures to tropical temperatures. Manson suggests that the parasite may have been *filaria perstans*.

Emily describes *craw-craw* as beginning with the appearance of reddish-tinted macules of a pruritic character, ultimately forming large, coin-sized ulcers, with reddish areolæ, clean-cut edges, and granular secreting floor furnishing a dense crust.

The ulcers of *craw-craw* are commonly multiple, may occur on any part of the body, but especially upon the limbs, and are complicated and massed by the results of scratching, as the itching is often intolerable.

The "Coolie-itch," described by Nicholls, is a strictly papular disease, without development of vesico-pustules.

Scheube and his colleagues believe that Plehn's *Dermatitis nodosa* observed on the Cameroon coast, is wholly different from *craw-craw*, though described under that name. The former is a strictly papular disease, the nodules being pin-head to pea-sized, occurring on the inner faces of the thighs, the scrotum, the inguinal folds, and the gluteal region. About two out of ten negroes are affected. The disorder is distributed by scratching. No filariæ were discovered.

Etiology.—The exact cause of the disease in all probability differs in different cases. The affection, as described by all writers, is both contagious and auto-infectious.

Treatment is by cleanliness and the employment of appropriate parasitocides, as boric and carbolic acids, and solution of corrosive sublimate 1-1000.

Prognosis is, in general, favorable, though in some of the cases described by Plehn, the patients were in a pitiable state.

CHAPPA.

Chappa is a disorder described by Read (vide Manson) occurring in the Lagos Colony, characterized by severe muscular and articular pains, with swelling of the joints and development of multiple pigeon's egg-sized nodules, subcutaneous in situation, over different parts of the body. The nodules burst, leaving ulcers with a "fatty-looking" base. The ulcers may fuse and become serpiginous. Other nodules may undergo resolution. Manson believes that the disease may be a tertiary phase of yaws.

CLIMATIC BUBO.

Under this title has been described a species of non-venereal inguinal adenopathy occurring chiefly among the crews of ships touching at African, Chinese, Japanese, and West Indian ports.

Symptoms.—The disease is reported as beginning with remittent febrile symptoms associated with sub-acute crural or inguinal adenopathy affecting one or both sides of the body (groins or crural regions) the swelling at times being of the size of a hen's egg. After weeks or months there may be subsidence of the glandular or peri-glandular infiltration: in other cases, suppuration occurs, and the disease may be terminated with surgical interference: or fistulous tracts may form which untreated persist for long periods of time.

Jackson properly points to the impropriety of the name by which the disorder has been described by Scheube. The disease is apparently non-climatic. Manson suggests that the adenitis may result from a virus introduced by the bites of insects on the lower extremities or genital region.

Treatment.—The treatment in the acute stage is by hot bichloride fomentations with supporting general measures and surgical interference when this is indicated.

GOUNDOU.¹

(ANAKHRE; HENPUYE; BIG NOSE; DOG NOSE. *Fr.*, GROS NEZ.)

Goundou is a disease first described by MacAlister in 1882, chiefly exhibited in the dark-skinned races, occurring at first in childhood with more or less persistent cephalalgia soon followed by a purulent rhinitis and the development of symmetrical, bean-sized and larger tumors on the sides of the nose, due apparently to a specific osteitis of the nasal process of the superior maxilla. The nasal ducts, and the skin over the tumors are apparently spared. As the disease progresses, the swellings may become as large as a hen's and even an ostrich's egg.

Wellman disposes of the several theories that the disease is a species of yaws; of atavism due to a tribal peculiarity; that it is due to syphilis, to non-union of the nasal and frontal bones, or produced by larvæ in the nostrils.

The pathology, etiology, and proper treatment of goundou are unknown.

AINHUM.²

(From a Nagos term, meaning "to saw.")

(DACTYLOLYSIS SPONTANEA; BANKO-KEREUDE; SUKHA POKLA; QUIJILA. *Ger.*, ABSAGEN.)

Ainhum is an affection of the colored races chiefly, especially of the negroes of the West African Coast, as also of the natives of the

¹ Literature: Manson, loc. cit., p. 798; Jackson, loc. cit., p. 495; Wellman, J. A. M. A., 1906, p. 636; Maxwell, J. of Trop. Med., 1900, Nov. 11 and Dec. 15; Lamprey, Brit. Med. Jour., 1887, Dec. 10.

² Manson, p. 802; Scheube, p. 564; Hirsch, Handbuch der hist.-geog. Pathologie, 186, iii., p. 504; Moriera, Monatshefte, 1900, xxx., p. 361; Herrick, Phila. Med. Jour., 1898, i., p. 246.

Soudan, of Algiers, Egypt, the Transvaal, and, next to Africa, of the inhabitants of Brazil, though it has been reported in Rio de Janeiro, Buenos Ayres, the Antilles, and British Guiana. The disease was first described and named by Dr. Da Silva Lima.¹ It is possible that Clarke² may have observed the same or a similar condition, described by him as a dry gangrene of the little toe.

American cases have been reported by Herrick, Shepherd, Matas, Hornaday and Pittman, Wheatland, and Brayton.³ Though most of the patients have been negroes, it has been recognized in a few cases in white subjects.

Symptoms.—Ainhum affects the smaller digits, chiefly the little toe, but also other toes and fingers, sometimes one or more of the digits of the same foot or of both feet being involved simultaneously or successively. The onset is by the development of a furrow or shallow groove on the plantar face of the toe or palmar aspect of the finger near the digito-plantar or digito-palmar web. This furrow gradually deepens and spreads in a circumlinear direction until the digit is girdled by a constricting and indurated ring in the form of a superficial depressed gutter. The segmented portion of the digit becomes swollen, in consequence of the constriction, to twice or several times its normal size; and in time, usually in the course of two to ten years, the segmented part, at first resembling a small potato attached to a slender pedicle, drops from its original attachments. In this way a species of spontaneous bloodless amputation is effected. The nail of the member that is about to be detached by this process usually turns outward, the digit being commonly laterally everted. The changes in the segmented part, both in the nail and the tissues of the phalanges, are those naturally arising from strangulation of the member. The disarticulation may be effected at the first, second, or third joint: or even in the continuity of the phalanx. There is little pain save such as is produced mechanically by the use of the foot or hand from which the digit depends. Occasionally ill-conditioned and foul-smelling ulcers develop. In rare cases ulceration persists in the site of the wound left after separation of the digit.

In some instances trophic, vasomotor, and sensory changes, particularly of the limb where ainhum is progressing, are striking features of the case. The skin of the part may be pigmented, sealing, wrinkled, puckered, with wasted muscles, or covered with an unusual pilary growth, the tendon-reflexes obliterated, and sensibility decreased. Thickening and shortening of the foot, flattening of the plantar arch, and palmar and plantar keratoses may be conspicuous. We have seen three cases in white subjects (one in France) where

¹ *Gazeta Med. da Bahia*, 1867, Nos. 13 and 15.

² *Trans. Epidem. Soc. of London*, p. 105.

³ *Cf.* Da Silva Lima, *Arch. of Derm.*, 1880, Oct., and several other communications by the same author; Shepherd, *Amer. Jour. Med. Sci.*, 1887, Jan. (with cut); *Ref. Handbook of Med. Sci.*, Art. Ainhum, with four cuts; Hornaday and Pittman, *N. Car. Med. Jour.*, 1881, Sept.; Brayton, *J. A. M. A.*, 1905, July 8 (with cut); Wellman, *J. A. M. A.*, 1906, Mar. 3, p. 636 (with analysis of etiologic theories); Wheatland, *J. A. M. A.*, 1905, Aug. 26, p. 631 (with cut).

there was coincident palmar and plantar keratosis obviously of the same character as that to be recognized in the dense sclerotic ring which was working the amputation of the digit.

Etiology.—The disease occurs more often in male subjects of the African race, and in adults; but is recognized also in children, and quite rarely in the white races. Wellman reviews the several arguments urged in explanation of the disorder and disposes of the theories that ainhum is a leprous lesion: that it is a trophoneurosis: that it is the result of self-mutilation: and that it is a circumscribed scleroderma. He believes with Manson that continued irritation produced by wounds of the foot in sharp grasses in the dark-skinned races prone to the production of keloid, is responsible for the disorder. He also suggests that the chigger may be at times a factor in its production. In some instances the disease would seem to be hereditary as there are reports of families every member of which has suffered. In other instances several members of two generations of a single family have developed ainhum.

Pathology.—The constricting ring is composed invariably of fibrous tissue, surmounted by a thickened epidermis. There is commonly an increase of the subcutaneous fatty tissue. The bones apparently suffer secondarily from the constriction.

Treatment.—The treatment required in well-marked cases is by surgical removal. Prophylaxis is by protection of the feet.

Prognosis.—The disease progresses slowly; relapses are rare; the process in general ends with removal of the constricted member.

GANGOSA.

Gangosa is a disorder endemic in certain countries such as Bolivia, the Philippine and Caroline Islands, British Guiana, Jamaica, and other parts of the West Indies, but especially in the island of Guam, where it is said to have existed for the last 150 years.

The disease in many of its features strongly suggests rhinoscleroma, a malady with which some authors hold it to be identical.

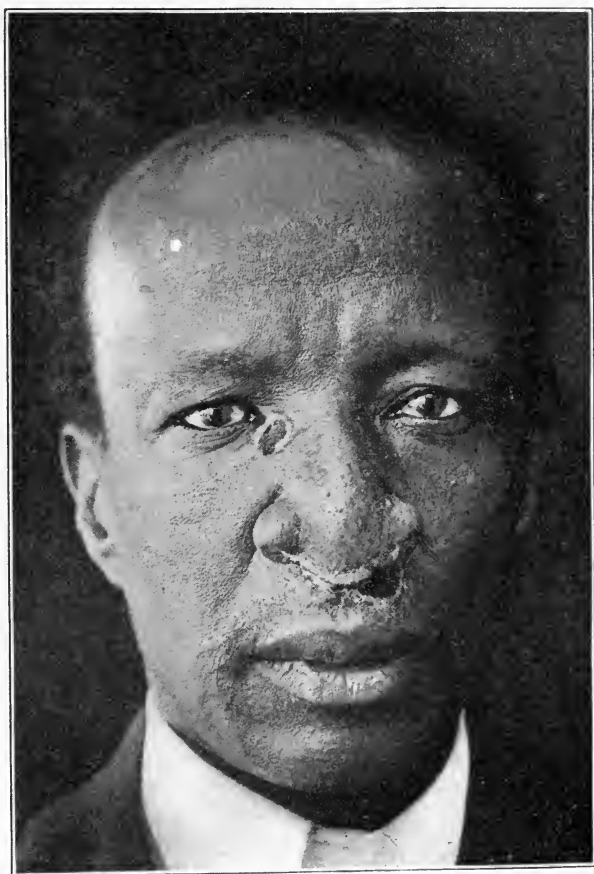
Symptoms.—Gangosa is characterized by a destructive ulceration commonly beginning by attacking the soft palate, pillars, or uvula and extending thence to the hard palate, and the nasal cavity, downward to the larynx and upward to the face. The destructive process is either acute or chronic and may terminate either by cicatrization or by extensive destruction of tissue with mutilation. Constitutional symptoms are wanting or developed in very mild forms.¹

Geiger recognizes three types of ulceration of the upper air-passages common in the island of Guam: (a) Septic forms due to the usual pyogenic organisms; (b) ulcerations that are obdurate to

¹ Mink & McLean, J. A. M. A., 1906, Oct. 13, p. 1166 and supplementary paper, J. C. D., 1907, November; Fordyce and Arnold, J. C. D., 1906, January; Leyes, Jour. Trop. Med., 1906, Feb. 15; Senn, J. A. M. A., 1908, Jan. 11, p. 116; Geiger, U. S. N. Med. Bullet., Jan., 1908; E. R. Stitt, J. C. D., March, 1908, p. 103.

antiseptic treatment, a group inclusive of most forms of gangosa. An organism closely resembling the bacillus of diphtheria, has been recognized in every case examined, and was found in pure culture in the conjunctival sac when the eyes were involved. In a third group, distinct nodules or tubercles develop, involving the skin or mucous membrane of the nose, soft palate, pharynx, larynx, or lips.

FIG. 218.



Gangosa. (FORDYCE.)

Diagnosis.—The disease is to be distinguished from blastomycosis, leprosy, rhinoscleroma, actinomycosis, lupus, and syphilis. With respect to the last named disease syphilis is said not to exist upon the island of Guam, where from one to nearly three per cent. of the population have gangosa.

The disease is contagious, transmissible by direct contact, and is diminishing in those places where patients are segregated.

Treatment is unsatisfactory. Mercury and iodine internally are

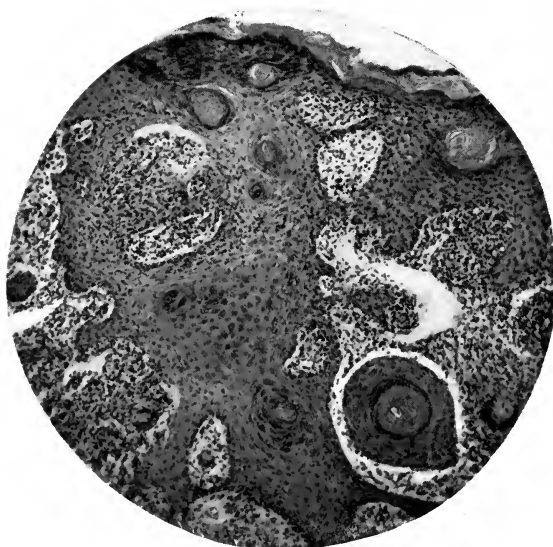
FIG. 219.



Gangosa.

Showing the diffuse infiltration of the corium with round, plasma, and giant cells. The vessels are the seat of an endarteritis, many of them being obliterated. (FORDYCE.)

FIG. 220.



Gangosa.

Tropical ulceration involving nose, pharynx, and larynx. Hyperplasia and down-growth of the epidermis with cellular infiltration of round, plasma, and giant cells in the corium. (FORDYCE.)

of little value. The best results are secured by antiseptics and care of the general health.

VELD SORE (NATAL SORE).

(BARKOO; BARCOO ROT, OF QUEENSLAND.)

Under this title has been described a disorder which seems to be related to the Oriental Boil which Crocker¹ reports as somewhat common among the medical officers and soldiers of the English army during their late war in South Africa. It most often attacked cavalrymen. As distinguished from the Natal Sore which was chiefly found in the lower part of that country, the Veld Sore was most abundant in the high barren table-lands. Multiple lesions appear on the hands, forearms (chiefly on the backs), feet, and legs, but were rare on the face and exposed portions of the body. They commonly resulted from an infected invasion atrium to which the large horse-flies of that region had access. A pinhead-sized pruritic papule, vesicle, or pustule first appeared subsequently enlarging and filling with a yellowish serum which became later turbid, ruptured, and left a small to large coin-sized, painful, crusted ulcer, exuding sero-pus and often accompanied by inflammation of the lymphatics and glands. In some cases the back of the hand was entirely covered. A diplococcus was found growing freely in ordinary media somewhat resembling staphylococcus aureus. Crocker is inclined to believe that the disorder is a variant of impetigo contagiosa.

The usual treatment of such infected lesions (boric and carbolic acid fomentations and ointments) was speedily effectual.

GAYLE.

Crocker,² under this title, describes an affection of ewes in the lambing season who are liable to a species of puerperal disorder undoubtedly infective. Men who have skinned the animals dead of the disease have suffered by inoculation, producing at the site of the infection, a flat-chambered vesicle or bleb, slightly depressed at the centre, a centimeter or more in diameter, bluish-gray in color, surrounded by a halo, and containing clear or blood-stained serum. There is apt to be axillary adenopathy; the hand may swell. Klein has demonstrated the staphylococcus hemorrhagicus. In some cases there is pain and mild fever.

Treatment has been by sublimate lotions.

¹ Diseases of the Skin, 3d ed., 1903, p. 1075.

² Ibid., p. 509.

CLASS XI.

DISEASES OF THE MUCOUS MEMBRANES IN PROXIMITY TO THE SKIN, OCCURRING IN ASSOCIATION WITH DERMATOSES.

The anatomy of the mucosa in general does not differ greatly from that of the integument. It possesses a proliferating basal layer of cells, the daughter-cells of which become differentiated so as to form finally a superficial protective layer composed normally of nucleated cells smaller than those recognized in the epidermis of the skin, but destitute of prickles and not containing keratin. The transitional layers of the epidermis are not present in the mucosa and, therefore, keratohyalin and eleidin are absent. The cells which correspond to the stratum corneum are more moist and on account of the absence of keratin are not so resistant. The daughter-cells after differentiation appear as large cells with small, nuclear, scanty, peripheral protoplasm with a relatively large, clear, perinuclear space. In the deeper portions the intercellular lymphatic spaces are well-defined and are crossed with prickles. In some pathological conditions where the mucosa becomes thickened, the differentiation of the cells progresses to a point where definite prickles are formed and the elements of the protective layer much more closely resemble those of the stratum corneum of the epidermis.¹

DISORDERS OF THE CONJUNCTIVA AND EYELIDS.²

Demodex Folliculorum.—The hair-pouches of the eyelids are occasionally invaded by the *Demodex folliculorum*.

Trichiasis.—The hairs growing upon the edges of the lids in some cases become incurved and ingrowing, with the result of producing severe local irritation, both in the lid and ocular globe. In aggravated cases the hairs have to be removed by the methods available in electrolysis.

“Eczematous Conjunctivitis.”—In eczematous disorders of the face, an efflorescence, beginning with millet-seed-sized points, may produce a distinct elevation of the conjunctival surface with vascular injection, and an exudate not different from that seen upon the skin.

¹ References: Quaide, B. J. D., 1908, xx., p. 242; Macleod, *ibid.*, 1899, xxi., p. 137; Rausch, *Monatsh.*, 1897, xxiv., p. 65.

² Cf. Fuchs, *Ophthalmology*, 3d ed., p. 110.

There is usually moderate infiltration, profuse lachrymation, and some photophobia.

The most of authors on this subject regard this as one of the frequent ocular diseases of youth and childhood, occurring in the scrofulous and particularly in children who are insufficiently nourished and in an unhygienic environment. Patches of weeping eczema are usually found in these cases over other portions of the body, especially the face; and the nose and upper lip are often irritated by the resulting coryza.

The disease is usually relieved in a short time by protection of the eye and dusting with very finely levigated calomel; or the application of white precipitate ointment, one to two grains (.06 to .013) to one drachm (4.) of fatty base.

The Exanthemata.—Among the exanthemata, measles is most commonly productive of conjunctivitis in connection with the cutaneous exanthem. In variola the pustules not rarely develop on the conjunctiva, generally upon the tarsal surface. In some cases a purulent keratitis results.

Acne Rosacea.—The lesions of this disease occur chiefly in adults who are suffering at the time with rosacea. The disease is characterized by the formation of minute nodules upon the conjunctival surface productive of considerable irritation.

The diagnosis is rendered facile by the coexistence of the disease with a dermatitis of the face.

The treatment is largely that of eczematous conjunctivitis.

Pemphigus.—The symptoms of pemphigus develop upon the conjunctival membrane as upon the skin proper. The lesions are first grayish spots, which as they progress become denuded of epithelium and leave cicatricial tissue behind. As the spots multiply, the conjunctiva becomes whitish, cloudy, and contracted; trichiasis may result as the distortion of the lids follows. The excretory ducts of the lachrymal gland often participate in the process; the cornea eventually becomes involved; ulceration may follow; and in severe cases the lids become agglutinated to the ocular globe. Blebs rarely develop on account of the anatomical character of the membrane involved. Coincident and similar lesions of the mouth, throat, and nose usually occur. The course of the disease is commonly slow.

Lupus Vulgaris may traverse the border of the lid and affect the conjunctival membrane, an ulcer developing in this region much more speedily than upon the skin. Tubercle bacilli have been recognized in the granulation tissue at the base of such ulcers.

Epithelioma of the conjunctiva occurs as a flat, non-pigmented sessile tumor, at first seated upon the superficial layers of the conjunctiva; later extending and ulcerating. It may occur as one of a group of superficial epitheliomata of the face.

Lesions of this character in childhood commonly arise in connection with xeroderma pigmentosum.

Hydroa Puerorum.—In children with skins sensitive to the direct

action of the sun's rays upon the surface, we have seen the blebs of hydroa puerorum develop as well upon the conjunctiva and cornea as upon the skin of the ears and face. The simpler soothing lotions with exclusion of the light have been successful in giving relief.

Herpes Simplex and Herpes Zoster.—In some of the herpetic affections described under these titles, the external surface of the eye participates in the cutaneous disorder, at times with grave results to the organ of vision. In the simple forms of herpes, minute vesicles appear not only upon the nose, the lids, and the ears, but also upon the cornea. Like the cutaneous lesions, they are frequently grouped, are usually short-lived, and after rupture leave superficial abrasions, with faint opacity of the floor. In severe cases the ulcerations of this cornea are grave.

Zoster Ophthalmicus.—In this disease the symptoms are similar, but often of much more severe type, the pains, as in zona of the skin, persisting after the rupture of the vesicles, the parenchyma of the cornea becoming cloudy, a deep keratitis resulting. In most well-marked cases of this disorder, the tumefaction of the lids at the height of the process renders examination of the cornea especially difficult.

Other diseases, such as herpes iris, dermatitis herpetiformis, ichthyosis, and syphilis occur with lesions upon the skin and conjunctival complications. Chanères of the conjunctival membrane are exceedingly rare. All the macular, papular and pustular syphilides of systemic disease may develop upon the external surface of the eye.

Lepra.—There is no tissue of the ocular apparatus which may not be invaded by the lepra bacillus, with results ranging from the milder forms of conjunctivitis to the gravest panophthalmia.

Circum-corneal, conjunctival, and scleral translucent nodules, non-vascular, yellowish in hue, develop not merely upon the surface, but invade the deeper structures of the eye, and eventually by breaking down lead to destruction of the entire organ. One of the conspicuous features of most leproseries is the large number of totally blind inmates. For full details of lepra as it affects this region, the reader is referred to the masterly treatise on this subject by Lie of Bergen.¹

Blastomycosis.—Pusey, Carpenter, Hosmer and Smith² describe peculiar blastomycoid conditions encountered in two cases of parasitic conjunctivitis. The lesions upon the conjunctiva were papillomatous growths several millimetres in diameter, slightly tongue-shaped, rounded, softish, moderately red, and occurring in the lower inner conjunctival cul-de-sac. The organisms depicted strongly resemble those first recognized in California in the cases described by Rixford and Gilchrist.

¹ See also: W. H. de Silva, *Lepra ophthalmica* in Ceylon (abstr.), Brit. Med. Jour., London, 1907, ii., p. 1135. A. W. Ormond, Notes on two cases of leprosy affecting the eyes, Practitioner, London, 1907, lxxix., pp. 245-251, 2 pl. (more recently published).

² Univ. of Penn. Med. Bull., 1908, Nov., xxi., 9, 6 cuts.

DISORDERS OF THE EXTERNAL AUDITORY MEATUS.

Furuncles of the External Auditory Meatus are not an infrequent accompaniment of similar lesions in the skin especially about the ear, though often resulting from direct infection of the hair pouches. In severe cases the condition may be differentiated from mastoiditis by the absence of aural discharge. The treatment of the furuncle is, first, by soothing applications (ichthyol salves or carbolated and opiated lotions), and eventually by incision of the suppurating focus.

Syphilitic lesions of the external meatus are rare, and usually due to infection by contaminated media. The more common of luetic lesions in this region are condylomata, developing as verrucoid, grayish or whitish growths, interfering with the permeability of the canal and giving rise to a fetid discharge, tinnitus aurium, deafness, and pain. The local treatment is by insufflations of finely levigated calomel, which may be well mixed at times with boric acid and talc. The systemic treatment of the disease is of chief value.

Otomycosis (*Myringomycosis*; *Fungoid Otitis Externa*).—In almost all cases of invasion of the auditory canal by vegetable parasites a septic discharge has prepared the way for the invasion. When the *aspergillus niger*, or *flavus*, or *fumigatus* invades the canal, the walls and fundus are usually either blackened as though coated with fine coal dust, or with the *flavus* form, have a yellowish aspect, suggesting that it has been dusted with iodoform or the pollen of certain plants (Barnhill and Wales). The dichotomously dividing mycelium with beaded ends is readily recognized under the microscope, the interlacing fibers entrapping in their loops the epithelial cells. The underlying surface is left eroded and hemorrhagic when the mass of vegetation is scraped or pulled away.

Examination of the débris removed from the ear reveals the interlaced hyphæ of the vegetation with spores and occasional flower-like masses which constitute the sporangium of the fruit-capsule of the *aspergillus*, this last containing the receptaculum and radiating sterigmata bearing the conidia. Diffuse inflammation, otorrhea, and eczema of the part may result. There is usually some deafness, with a sensation of ringing in the ears, and at times a thin serous discharge from the external auditory meatus. Löwenberg recommends for the destruction of the mould the injection of dilute alcohol into the canal and the subsequent insufflation of boric acid in powder.

DISORDERS OF THE NASAL CAVITIES.

Syphilis.—Initial lesions of the mucous lining of the nose are exceedingly rare. The nares are most commonly involved in the inherited form of the disease, where the passages are blocked by the mucous secretions from the involved membrane. In this condition mucous patches are rare, the essential condition being a gummatous infiltration of the membrane. In extreme cases severe ulceration fol-

lows, with destruction of bone and mutilation. Infants affected with this disorder are commonly supposed to be suffering from "snuffles." The nostrils and upper lip are frequently excoriated by the muco-purulent secretion from the nares. In adults gummatous processes often result in perforation of the septum.

Tuberculosis.—Lupus of the nostrils is a more common affection than is generally believed, and is characterized by the development upon the mucous membrane of minute nodules similar to those occurring in lupus vulgaris. When these break down and ulcerate, extensive losses of tissue (mucous membrane, cartilage, bone) occur. Rarely perforation of the septum results, as in syphilis.

The process is exceedingly chronic and when not checked by modern methods of treatment may develop to the point of producing extensive mutilation and disfigurement.

Rhinoscleroma.—The lesions of this rare disorder occur chiefly about the nostrils and upper lip, as described in the chapter in this treatise devoted to that disease. In some cases the mucous membrane is extensively involved, the lesions at first being firm, somewhat reddish nodules which develop very slowly and later involve the alæ of the nose and the septum. In severe cases the throat, larynx, and trachea are involved.

Glanders.—This contagious disorder involves very frequently the nasal mucous membrane, its onset being accompanied by the formation of nodules which rapidly become pustular and finally ulcerate, furnishing thus a muco-purulent and offensive discharge from the nostrils. The lesions at first are papules, seated on a reddened and swollen base, which rapidly burst, become crusted, and develop into deep ulcers which extend rapidly. The larynx and throat as well as the mouth are usually involved. The accompanying systemic condition is usually well marked, including chills, fever, and the development of scarlet- to purplish-red erythema spreading over the nose and face, from which spring vesicles which burst and discharge. The disease is produced by the *bacillus mallei*.

Lepra.—Dr. Morrow, of New York, believes that many cases of leprosy are transmitted from one individual to another by the medium of the nasal passages. In many cases the mucous membrane lining the nose is infiltrated with lepromatous growths which, as on the mucous surfaces of the eyes and the mouth, slowly degenerate, ulcerate, and produce an offensive discharge. The cartilage often breaks down; the tip of the organ becomes depressed, somewhat as in lupus vulgaris, and the resulting ulceration in severe cases extends over the mucous membrane of the mouth, tongue, pharynx, glottis, and the epiglottis. The changes are similar to those recognized in lepra of the eye and the mouth.

DISORDERS OF THE MUCOUS MEMBRANE OF THE MOUTH. FORDYCE'S DISEASE.

(PSEUDO-COLLOID OF THE LIPS.)

This is a chronic disorder limited to the mucous membranes of the lips and oral cavity, characterized by discrete, yellowish or light-colored, milium-like lesions unaccompanied by subjective sensation.

The first case was described by Fordyce,¹ in 1896, at which time, and for a brief time after, it was thought to be rare, but subsequent observation has demonstrated that it is relatively common. It is more frequently detected on examination for other lesions, as patients rarely apply for its relief, owing to the insignificant subjective sensations.

Symptoms.—The lesions are situated most frequently on the upper lip, lower lip, and on the oral mucous membrane extending along the line of the teeth as far as the last molar. They may be few or abundant, at times forming a band by aggregation of individual lesions. They vary in color from a yellowish hue on the lips to a whitish shade inside the mouth. They are primarily maculo-papules and are best seen by putting the mucous membrane on the stretch.

Etiology and Pathology.—White,² in 70 per cent. of sixty-five cases, found these lesions in association with other disorders of the sebaceous glands, such as acne, rosacea, seborrhœic dermatitis, and alopecia furfuracea. The same proportion of these patients suffered from dyspepsia. The disease develops more frequently in males than females and most commonly between the ages of twenty and forty years though it occurs both before and after these periods. Fordyce originally attributed the condition to a granular degeneration of the rete cells. White confirmed this. Other observers found hypertrophy of the sebaceous glands a conspicuous feature.

Treatment. is usually not required, and when instituted is of little avail.

Prognosis.—The disease is persistent, though benign in nature and productive of little discomfort or inconvenience.

PERLÈCHE.³

(Fr., *Pour lèche*, to pass the tongue over the lips, to lick.)

(LABIALITIS; BRIDOU; POISSONNADE; NIARDE.)

Under this title, Lemaistre and others have described a contagious disease of the lips recognized in many cases in children and also

¹ Fordyce, A peculiar affection of the mucous membrane of the lips and oral cavity, J. C. D., 1896, xiv., p. 413.

² White, C. J., Fordyce's Disease, J. C. D., 1905, xxiii., 97. (A review of the literature, with discussion and report of a clinical study of sixty-five cases, with histopathology of one case.)

Literature: Lemaistre, Le Progrès Méd., 1884, 1885, November. Jaja, Giorn. Ital. d. Mal. ven., 1887. Morretti, Riv. Clin. d. Bologna, 1886; Raymond, Bull. de la Soc. de Derm. et de Syph., 1893, p. 289. Planche, Thèse de Paris, 1897. Jacquet, Le Prat. Derm., 1902, iii., p. 839; Annales, 1902, s. iv., iii., p. 29. Beureau et Fortineau, Presse Méd., 1902, Gaz. Hebd. méd. et chir., 1901, Oct.; Svestre and Gastou, Soc. des Hôp., 1891.

PLATE LVII

FIG. 1

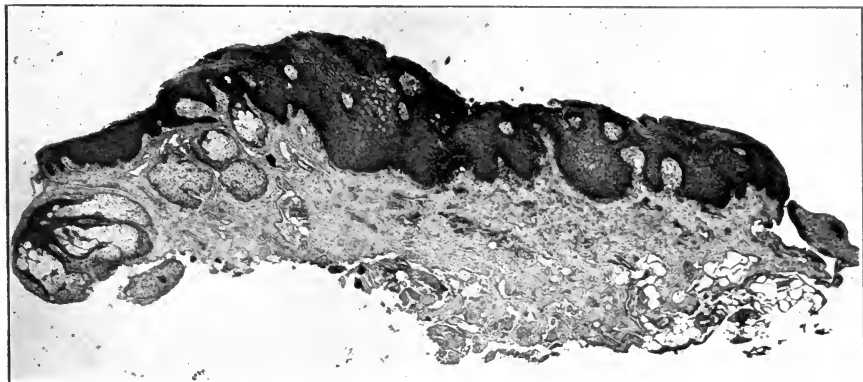
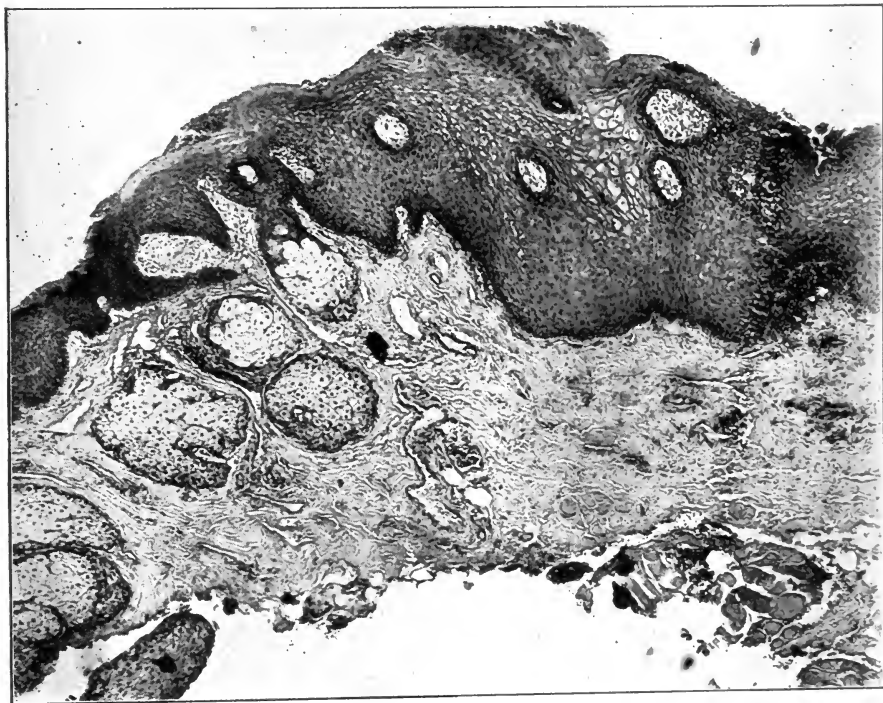


FIG. 2



Fordyce's Disease. (C. J. White.)

FIG. 1. (Section.) Low power. Showing on the left the sebaceous structures, lying for the most part under the epidermis covered by torn skin. On the right appears the disease proper, consisting of a greatly hypertrophied epidermis.

FIG. 2. (Section.) High power. Illustrating in detail the points described in Fig. 1. On the extreme left can be seen the granular and horny layers of the torn skin over the sebaceous glands. Adjoining this area can be seen the parakeratotic process beginning. Farther toward the right can be seen the hypertrophied epidermis; the somewhat abnormal palisade layer with its infiltrating cells; the oedematous, poorly staining rete cells; the highly swollen reticulated cells; the superficial parakeratotic cells; and lastly, the widely dilated lymphvessels and bloodvessels of the corium.



occasionally in adults. The disease is unquestionably contagious and transmitted, either directly or by media brought in contact with the lips, for example, by the use of cups in common.

Symptoms.—In this disorder the labial commissures are symmetrically involved, the epithelium in the infected subjects being produced in excess, folded somewhat upon itself, and presenting a whitish or macerated aspect as the result of which the mucous surface of the lip is readily denuded. The disease not rarely spreads from the lips to parts in the vicinity which, in that event, present the appearance of a whitish pellicle, projected and folded, passing from the corner of the lips outward.

Beneath the pellicle thus formed, the surface is somewhat reddened and when irritated bleeds. The parts are rarely painful, though there is a moderate amount of itching, which leads the young subjects of the disorder to thrust the tongue from the mouth and in this way to moisten the affected region. In a few cases the parts are painful, wide opening of the lips producing fissures of the commissures and some pain.

According to Jacquet, there is frequently an incidental coryza or diphtheroid stomatitis. In some cases the disease coexists with alopecia areata of dental origin. The disorder is short-lived, yielding readily under proper treatment, leaving in many cases for weeks a white polished surface which only slowly recovers its natural tint.

Diagnosis.—The recognition of the disease is facile considering its location and its symmetry, its acute form, the absence of inflammation, and of the symptoms of labial herpes and eczema. Care should be taken to avoid its confusion with syphilis of the commissures of the lips.

Etiology and Pathology.—Lemaistre discovered a streptococcus which he called *streptococcus plicatilis*, isolated in some cases, and also found upon utensils employed by those who suffer from the disease. Raymond, Planche, and others, however, have recognized in these cases a staphylococcus albus and a staphylococcus aureus. The disease is evidently one of uncleanliness, propagated chiefly among children of the poor, and is best treated by such prophylaxis as is based upon proper hygiene.

Treatment.—Weak solutions of nitrate of silver, of the sulphate of copper, of alum, and of bichloride of mercury are all efficient, care being taken that these medicaments are not swallowed by the child. Medicated tampons are sometimes required for local treatment of the fissures and angry commissures of the lips. Weak white precipitate ointments are available when the patient is practically relieved by the other remedies named.

CHEILITIS.

A group of disorders, possibly of similar origin and character, have been described under different titles, in connection with inflammatory disorders of the lips. Among these may be named:

Cheilitis Glandularis (*Cheilitis glandularis apostematosa* [Volkmann]; *Infective follicularis*; *Cheilitis exfoliativa*; *Psoriasis labialis*; *Myxadenitis labialis*; Fr., *Pityriasis des lèvres*; *eczéma exfoliant des lèvres*.)

In the disease recognized by several authors under these titles, the lower lip is most commonly involved, chiefly the mucous face, but also the contiguous integumentary structures. The lip becomes tumid and tense, at times painful, and is studded with pin-point to hemp-seed-sized elevations, representing the muciparous glands, with dilated follicular orifices, often admitting for some distance a fine probe, from which exudes a thin, mucoid, or muco-purulent fluid—at times a clear thin serum. The crusting may be well-marked, the lips becoming agglutinated during the hours of sleep, and also when long at rest in the hours of the day. In some cases scaling occurs. Ravitch likens the symptoms in one of his cases to those occurring in Paget's disease of the nipple. In one of our cases we recognized the presence of a vegetable organism resembling oïdium. Heidingsfeld believes the parasitology of the disease is accidental.

We have treated several patients thus affected and have had satisfactory results from radiotherapy cautiously employed. This method has been employed with success also by Ravitch. Local asepsis is essential. Nearly a score of cases have been reported in literature.¹

"**Bael's Disease**" (Unna)² is a condition in which occurs an indolent swelling of the glands and periglandular tissues of the lip, supposed to be due to a special infection, the process ending with some scarring at the involved points.

"A peculiar eczematoïd eruption upon the lips" is described by Stelwagon³ beginning on the vermilion border, with slight irritation and scaling, unaccompanied by itching. The disorder is chronic in course, and often limited to the vermilion border of the lips, occasionally spreading to the skin of the adjacent parts. The morbid process does not result in destructive degeneration or scarring. The tongue has been similarly involved.

LEUCOKERATOSIS BUCCALIS.⁴

(LEUCOPLASIA, LEUCOMA, PSORIASIS LINGUÆ, SMOKERS' PATCHES OF THE MOUTH, BUCCAL PSORIASIS, ICHTHYOSIS LINGUÆ, TYLOSIS LINGUÆ, LEUCOPLAKIA BUCCALIS. Fr., LEUCOPLASIE, PLAQUES BLANCHES DE LA BOUCHE.)

In the year 1868 Bazin described with tolerable accuracy the several conditions indicated by the names given above; and since that date the subject has been enriched by a literature contributed by De-

¹ Volkmann, Virchow's Arch., 1870, p. 142; Purdon, B. J. D., 1893, v., p. 23; Galloway, B. J. D., 1895, vii., p. 113; Ravitch, J. A. M. A., 1908, li., p. 1685.

² Monatshft., 1890, xi., 317; Broes v. Dort., Derm. Zeitschft., 1895, iii., p. 328.

³ J. C. D., 1904, xxii., p. 351.

⁴ For full bibliography see Bénard, La Pratique Dermatologique, ii., p. 999, and Butlin, Diseases of the Tongue, London, 1900.

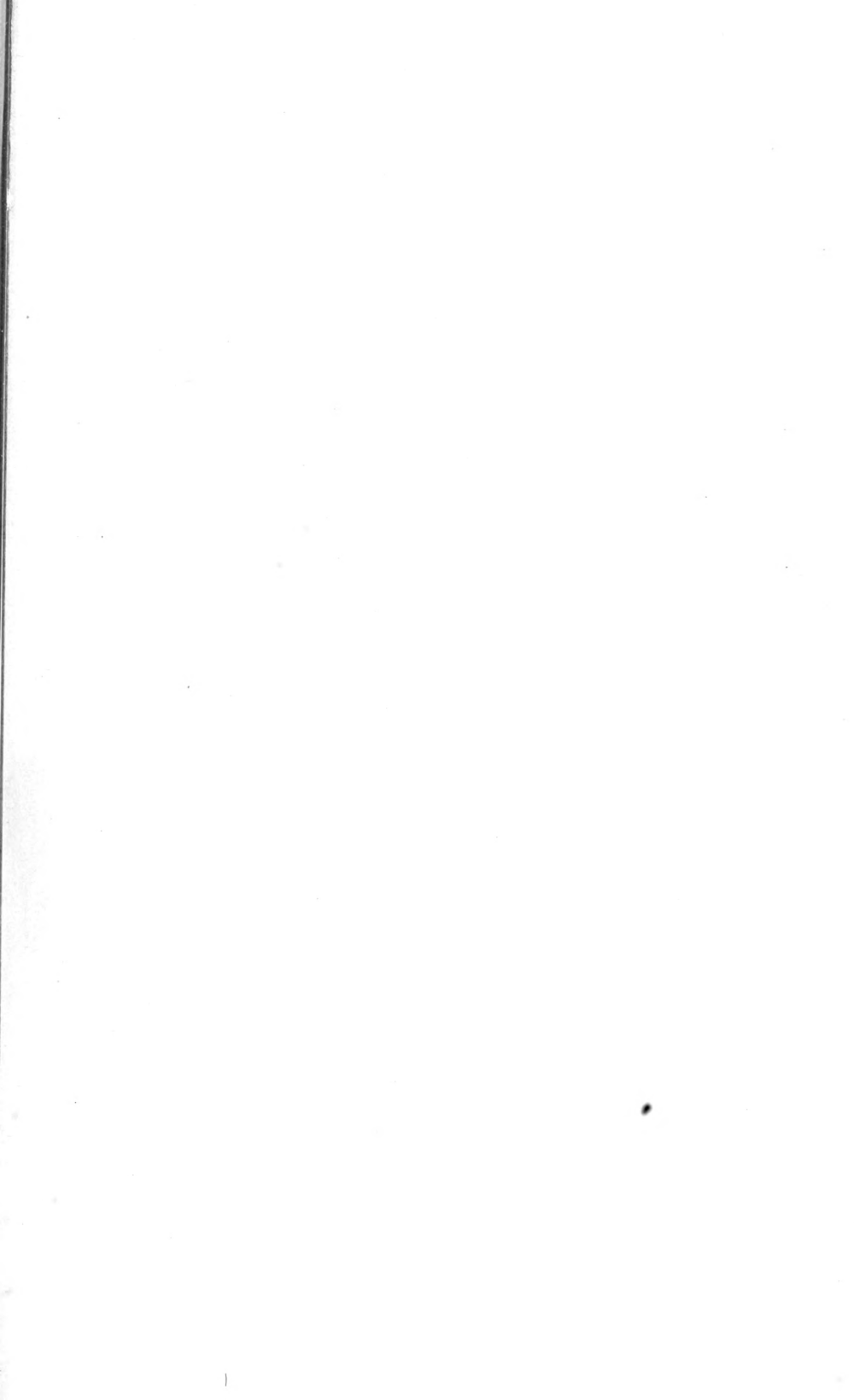
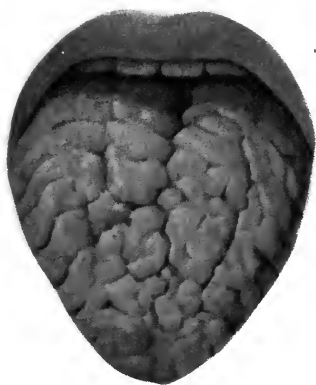


PLATE LVIII



Congenital Hypertrophy of
Tongue.



Leucoplakia of Tongue.



Leucoplastic Striæ of
Tongue.



Epitheliomatous Trans-
formation of Leucoplastic
Lesions of Tongue.

bove, Kaposi, Sigmund, Plumbe, Mauriac, Schwimmer, Ingals, and others.

Symptoms.—The disease is manifested chiefly in the mouth, but also in other mucous cavities, at the outset by some weeks or months of special sensitiveness to irritation produced by ingesta; later, by the occurrence on the inner faces of the lips and cheeks, and on the dorsum and edges of the tongue, of sharply outlined, dull-whitish, slate-colored, or silver-whitish points, disks, streaks, bands, ribbons, or patches of an irregular shape, either flattened or slightly elevated above the general level of the mucous surface. The aspect of the lesions often suggests that they have been lightly penciled with the nitrate of silver. The disease may occur in isolated points or in pin-head-sized nodules, discrete or confluent, and in cases grouped, the grouping being often in linear arrangements, following the lines indicated by the streaks or the striæ of similar composition.

The sites of election of these lesions are: the inner face of the cheek in a line following that traced by the conjunction of the teeth of the upper and lower jaw when approximated; the gums above the upper canine teeth and lateral incisors; the sulcus beside the upper and lower gums in the roof and floor of the mouth; the dorsum and edges of the tongue, where the arrangement is usually in lines along the longitudinal axis; and more rarely other parts such as the vaginal and other mucous membranes which have been involved.

When closely examined these lesions are found to be made up of a hyperkeratinized epithelium, being covered by an adherent and more or less dense pellicle, removable only by artificial measures and closely applied to the inferior stratum of the mucosa. The lesions are rough to the touch, both to the finger of the physician and to the tongue of the subjects of the disease, but are, as a rule, not painful, though at times annoying by producing a certain degree of stiffness and immobility of the parts affected. At times the membrane in the vicinity is reddened and tender. In other cases projecting, thick, rough nodules develop or a dense, well-defined elevated plaque.

These lesions are extremely chronic of evolution, requiring months and often years for their full development, and resisting in a remarkable way the action of topical medicaments. They may be removed without recurrence; or may recur after complete and radical ablation. If unmolested and not undergoing resolution (a termination somewhat doubtful of occurrence), they usually, by reason of increased density, crack or fissure at one or another point, the fissure extending to the derma and arousing a local inflammatory process with the production of pain and distress. The surface is then prone to exfoliate and ulcerate, and epithelioma of the mouth may result.

The proportion of the benign cases to those which result in epithelioma is not determined. Every leucokeratosis, however, may prove the initial stage of epithelioma, and the treatment of the former is, therefore, a matter of no little consequence. Leucokeratosis is prone to develop fissures and in cases where the patches are thickened or ver-

ruous, epithelioma often results. The cases which develop in syphilis cannot be distinguished clinically from others. They are classified by Fournier as para-syphilitic lesions, and are rebellious to treatment.

Etiology.—The cause of these cases is suggested by some of the names given above. The disorder occurs almost exclusively in the mouth of men, and usually after middle life. Unquestionably, the irritation produced by tobacco, whether used in smoking or chewing, and the influence of carious teeth or those with sharp edges after fracture irritating the edge of the tongue, are all important. We have, however, observed typical lesions in the mouth of men who had never contracted syphilis nor used tobacco. The resemblance of these lesions to the mucous patches of syphilis is obvious; and it is believed that syphilis, when not actively efficient in the production of leucokeratosis buccalis, may be one of its indirect causes. It is, however, important to note that all symptoms here described occur in persons who have never suffered from syphilis; and such symptoms are in the latter class as intractable as in others.

Pathology.—It is not definitely known if the primary change is a pure hyperkeratinization of the epithelium or an inflammatory process of the papillary layer. The horny layer is hypertrophied, the cells retaining their nuclei. In the derma there is always more or less inflammatory infiltration, and often the papillæ are partially obliterated. Fordyce states that the overgrowth and proliferation of the interpapillary processes are exceptional. Leloir insists that the epitheliomatous process always begins, not at the level of the hyperkeratosis of the mucous membrane, but below the fissure or other lesion induced by the induration of the plaque or streak, indicating, in other words, that the epitheliomatous change is rather an accident than an essential part of the process.

Diagnosis.—The diagnosis is chiefly from syphilitic lesions of the mouth, which should be recognized, as a rule, by their softness and tendency to ulcerate, as well by their situation, which is far less distinctive than in the case of leucokeratosis of the mouth. A history of infection and of symptoms of the disease in other regions of the body would usually indicate the nature of the process.

The only malady likely to be confounded with leucokeratosis of the mouth is lichen planus; and it is important to note that some confusion exists on this point in several descriptions of the two diseases.

In lichen planus of the mouth there may be recognized over the tongue, the palate, and other parts, dense, smooth or fissured plaques, rings, festoons, linear striae, or disks covered by a silver-whitish pellicle. It is clear that the distinction between these and leucokeratotic lesions is in a high degree obscure, and for the present the most that can be done is to search with special care for other symptoms of the disease upon the cutaneous surfaces of the body pointing to either lichen planus or to syphilis.

Treatment.—The treatment of leucokeratosis of the mouth is first by abstention from all local irritants (tobacco; highly spiced, heated, acetous, and iced articles of food and drink), by the care of the teeth, and by the employment of soothing sprays or lotions containing potassium chlorate, boric acid, balsam of Peru, iodized phenol, myrrh, or muriated iron. The most of the cases whether pre-epitheliomatous or of milder type have been successfully treated by us with radiotherapy; but advanced epithelioma, even though associated with leucokeratosis, commonly requires surgical ablation. In employing the x-ray in the mouth, the sound parts are carefully protected by ray-proof tubes.

Silver-nitrate may be applied to any ulcerated or fissured points, both in solution and by sweeping the solid crayon over the surface. The French make use of the salicylates in the same way.

Destruction or removal of the lesions may be secured by the employment of caustics, chemical or galvano-cauteric; by erosion with a curette; or by surgical ablation. When practicable, the burr of the dental engine may be used after injection of cocaine muriate. Where the patches are not too dense and extensive, this has generally been productive of good results. Vidal employed a twenty per cent. solution of chromic acid.

Sherwell reports complete removal of the patches by the use of undiluted liquor hydrargyri nitratis. The mouth is stuffed with cotton to protect adjacent parts; the solution is applied and allowed to remain from fifteen to twenty minutes, after which it is neutralized with sodium bicarbonate. If necessary, the application may be repeated two or three times at intervals.

Pierce was successful in one case after rubbing into the patches pyoktanin-blue, followed immediately with an aqueous solution of anilin-oil. The applications were made daily for three months.

For leucokeratosis of the vulvo-anal region complete excision has given the best results.

Prognosis.—The prognosis is fairly favorable in the case of all subjects of the disease who consent to deny themselves absolutely the luxury of tobacco-usage in every form, and who can follow a prescribed hygienic and medicinal course. For all others there is danger of epithelioma.

Variola.—Preceding the appearance of the skin manifestations of variola, intensely red, discrete maculo-papules may be seen upon the mucous membrane of the tongue, cheeks, palate, and pharynx. Owing to moisture and the delicate structure of the mucous membrane, these lesions, instead of passing through the vesicular and pustular stage, rapidly become superficial erosions or ulcerations, often covered with a whitish or grayish pultaceous pellicle. In number the mouth-lesions are less conspicuous than those of the skin; they are most numerous in the pharynx and upon the dorsum of the tongue; and may lead to great swelling of that organ (glossitis variolosa) and to extreme pain in deglutition.

Vaccinia.—Vaccinal lesions within the mouth through autoinoculation, while possible, are very rare. A case is reported of a woman who inoculated her tongue by sucking the virus from her infant's arm.

Scarlatina.—In this disease, shortly after the onset of general symptoms and before the appearance of the skin-eruptions, the fauces, palate, and tonsils present a deep-red coloration which later becomes somewhat punctate. Some swelling and œdema of the mucous membrane develop. The tongue is seen to be heavily coated with a white fur; this coating is first lost at the apices of the swollen papillæ, giving an appearance of bright red puncta scattered over a white background. Later the extra coat is exfoliated leaving the tongue intensely red and uneven by reason of the swollen papillæ—the so-called “strawberry tongue.”

Measles.—Koplik's spots which are believed to be diagnostic of rubeola occur on the mucous membrane of the palate, uvula, lips, and cheeks; and consist of irregular bright-red, pinhead to split-pea-sized areas in the center of each of which is situated a bluish-white punctum. These macules precede the cutaneous exanthem often as long as seventy-two hours.

Erythema Multiforme.—The upper and lower lips, inner faces of the cheeks, the gums, the soft and hard palate, and at times, the pharynx, exhibit the lesions of multiform erythema, occurring in the form of vesicles, hyperæmic macules, papules, and even blebs with serous or sero-pustular contents. The lesions begin as pin-point to large seed-sized, isolated, deeply tinted elevations.

In severe cases, painful erosions form. The parts then become tender and swollen; and when hemorrhagic erosions form, there may be ulceration of a superficial character. Similar lesions occur upon other mucous tracts (genital and facial). The patients are usually in middle life.¹

Psoriasis is a disorder affecting the skin in such a large proportion of dermatoses with accidental concurrence of lesions in regions of the body outside of the skin, that it is not surprising to find buccal and other phenomena coexisting with psoriasis of the skin. Dermatologists in general refuse to accept the fact of a true psoriasis of the mucous surfaces. Oppenheim² recognized the occurrence of multiple, round or oval shaped, well defined, bluish white plaques on the mucous surface of the cheeks and hard palate which when histologically examined, were recognized as the seat of a parakeratosis, with hyperkeratosis of the epithelium and inflammation of the papillary body. Elæidin and keratohyalin were absent; there were no sclerotic changes in the connective tissue of the bloodvessels.

Herpes Zoster may affect, with characteristic lesions, one side of the throat, cheeks, and gums, when the branches of the superior max-

¹ Cf. Caspary, Archiv, 1893, xxvi., 1; Eppinger, V. Cong. d. Deutsch. Derm. Gesellschft., 1895, p. 83; Kaposi, *ibid.*, 1895, p. 13; Neumann, Vierteljahr. f. Derm., 1886; Rosenthal, V. Cong. d. Derm. Gesellschft., 1895, p. 34, and V. Cong. d. Derm. Gesellschft., p. 556.

² Monatsh., 1903, xxxvii., p. 490.

illary are involved. There is usually coincident pain, dysphagia, and toothache. When the third branch of the trigeminus is involved, the side of the tongue may exhibit characteristic features. After removal of the crusts painful erosions may form.

The diagnosis is between the more common forms of neuralgia of the same region and herpetiform disease in general.¹

Pseudo-Herpes Buccalis (*Stomato-pharyngitis herpetica*; Fr., *Angine couenneuse commune*; *Angine vésiculeuse*; *Herpès du Pharynx*).

In the several conditions described under these titles, vesicles form on the mucous surface of the mouth, pharynx, and larynx, herpetiform in character. These lesions are pin-point to hemp-seed sized vesicles, surmounting a reddened base, often grouped, and when irritated producing erosions after bursting. There may be coincident tumefaction of the uvula, soft palate, larynx, and base of the tongue, often productive of much dysphagia. The disease usually concludes its career in from ten days to a fortnight. It has occurred in connection with tuberculin injections, the use of antipyrin internally, tobacco-usage (especially by smoking), icterus, malaria, pneumonia, erythema multiforme, and influenza.

The treatment is by proper dietetic precautions and soothing mouth-washes, when the special indications in each case have been met.²

Angioneurotic Œdema and Urticaria.—In these conditions the mucous membrane of the mouth may be slightly or very severely implicated. In mild cases, swellings like those of the wheal develop over the mucous membrane of the mouth, pharynx, and epiglottis. In severe cases the tongue may become so swollen as to project from the mouth and require blood-letting for its reduction. In yet other cases suffocation is threatened by enormous blood-red swelling of the epiglottis and pharynx. The causes are described under the general title of these diseases. Drug-idiosyncrasies, and the ingestion of shell-fish and of other special articles of food, such as the smaller berries with seeds, are responsible for some cases.³

Leukæmia.—In acute lymphatic leukæmia, hemorrhages, petechial and diffuse, and areas of ulceration and necrosis are frequently noted involving the mucous membrane of the mouth and nose. In chronic lymphatic leukæmia, lymphomatous nodules and tumors occur in these situations as well as on the skin.

Xanthoma.—Butlin describes a case of xanthoma ("xanthelasma") with eye-lid and conjunctival lesions, and characteristic patches on the palms, elbows, and knees, in which whitish, oblong, elevated plaques occurred on the sides of the tongue. Microscopical examination revealed a condition similar to that recognized in euta-

¹ See Kaposi. Path. u. d. Hautkrankht. Wien, 1893, also Kraus, Die Erkrank. d. Mundhöhle, Nothnagel's Encyc. Wien., 1902, xvi., p. 163.

² Brokhart, Monatsh., 1885, p. 164.

³ Cf. Kaposi, Hautkrankheiten, 3d ed., p. 324; also Melton, Vierteljahr. f. Derm. u. syph., 1877, p. 173.

neous lesions of the same character.¹ Rhodes² reports the finding of thickly set nodules in the vestibule of the larynx occurring in a patient suffering with generalized xanthoma. Histological examinations of these growths demonstrated their character.

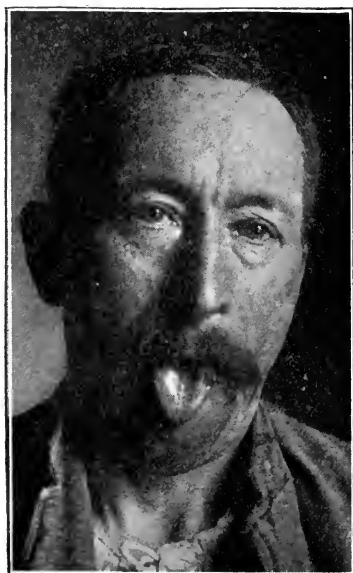
Adenoma Sebaceum ("*Pringle's Disease*").—In February of 1904, Buschke³ demonstrated the case of a lad thirteen years of age with lesions of adenoma sebaceum over the face and similar lesions in the mouth in association with telangiectases of the same part.

Lupus Vulgaris may produce nodules of granulation tissue in the mucous membrane of the mouth as well as the nose. The gums and soft and hard palate may become dull reddish in hue, spongy, eroded, ulcerated, or after repair become the seat of cicatrix.

Scherber⁴ calls attention to the value of hydrogen peroxide painted over ulcers in full strength, and used as a mouth wash diluted. He suggests its value indicates that the germs concerned are anaërobic.

Lichen Planus.—The lesions of lichen planus upon the mucous surfaces, heretofore described in connection with that disease as it occurs upon the skin, are, it has been asserted, more common in the mouth than is generally believed. As distinguished from other lesions of the same locality, the individual elements of the eruption are often recognized as isolated and irregularly distributed or grouped and linear, softish, pin-head-sized and somewhat larger, flat-tish papules covered with whitish mucus. When this last is removed, the eruptive elements do not greatly differ from those displayed in lichen planus of the skin.

FIG. 221.



Lichen planus of the mucous surface of the tongue.

Lupus Erythematosus.—The patches of lupus erythematosus occurring on the mucous membranes differ greatly from the lesions of the same disease upon the skin; and their exact nature has been questioned. Trautmann in thirty published cases finds the lips involved in forty-three per cent., the mucous membranes of the cheek in forty per cent., the palate in thirty-three per cent., and other parts of the

oral cavity in a similar percentage.

The patches are vividly red in color with depressed centers. Disseminated pearly-gray macules indicate the beginning of atrophy.

¹ Cf. Butlin, Treat. on the Tongue, p. 331.

² A case of Xanthoma Multiplex, with interesting throat complications, Laryngoscope, October 19, 1906, and Chi. Med. Recorder, May, 1908.

³ Monatshft., 1904, xxxviii., p. 32.

⁴ Deutsch. med. Wochenschr., 1907, p. 28.

The lips are not rarely involved in these cases by direct extension from the face though we have had under observation cases in which the lips and circumoral regions were the chief areas of involvement. The lips are often swollen, dull reddish in hue, dry, and scaling, the patches showing a reddish areola and a thinning center, dull whitish in hue. Dubreuilh recognized here, as in the skin, radiating or whitish and grayish lines over the patch disappearing when atrophic changes occurred. Morris¹ describes a case in which the tongue appeared to be denuded of its epithelium, having a brilliant red color and smooth shining surface. Warde² found that ten out of fifteen cases suffered from either hypertrophic or atrophic rhinitis, a position combated by Fordyce.

Syphilis.—The syphilitic lesions of the mucous lining of the oral cavity are described in this work under the title of that disease. The lesions include initial scleroses of the mucous or muco-cutaneous surface of the lips both within and without the vermilion border; initial sclerosis of the tongue, on the inside of the cheek, the palate, and the tonsils; mucous patches, scaling patches, and condylomata, chiefly affecting the cutaneous surface and also the muco-cutaneous surface.

FIG. 222.



Chancre of the lip.

Papules and bullous lesions of the erythema group of skin diseases can readily be taken for mucous patches. Relapsing herpes of the mouth shows as gray spots with red periphery and attachment of the epithelium at the margin. Burning pain is characteristic and is absent in mucous patches. Mercurial stomatitis may produce discoloration and thickening which would suggest the scars of syphilis or

¹ B. J. D., 1903, xv., p. 410.

² B. J. D., 1902, xiv., p. 332.

leucoplakia. Antipyrin and other anilin derivatives have produced erosions in the mouth which suggest specific changes.

Actinomycosis of Mucous Membranes probably results from vegetable ingesta through the medium of the mouth, respiratory tract, or the skin. The disease is of insidious origin, rarely acute, more often sub-acute in type, characterized at first by tumefaction of the cheeks, tongue, or floor of the mouth, accompanied by œdema, dysphagia, dyspnœa, and febrile phenomena. At times a carious tooth furnishes the invasum atrium. Multiple foci coalesce sooner or later, producing a hard firm swelling giving rise to a serous discharge. Ulceration, fistulous sinuses, perforation of the tissues affected often result. At times the picture presented is one of multiple, yellowish-white, abscess-like puncta, forming on a firm insensitive base. On the tongue which is most often involved, minute nodules may be recognized usually on the anterior half.

Precancerous Keratosis of the Mucous Surfaces of the Mouth.—Primary carcinoma of the mucous surface of the mouth occurs both as a sequel of leukokeratosis and also in cases where the patches of the disease last named have not been recognized. The change may follow any local irritation such as, for example, occurs in tobacco-chewers and smokers, and in the individual who is in the habit of chewing grain for testing it in commercial transactions. The parts most often involved are those nearest the vermilion border of the lip where a simple area of keratosis and scaly thickening of the part may occur, though the inner faces of the cheeks, the velum, and parts of the tongue and hard palate may be involved.

Cancer (epithelioma) is exceedingly common on the mucous and muco-cutaneous surface of the lips and somewhat more rarely over the entire mucous tract of the mouth, tongue, inner border of the lips, etc. In many of these cases a distinction between syphilis and carcinoma is exceptionally difficult, the problem often being solved only after excision of a portion of the morbid tissue and histological examination. The age of the patient and character of the growth (which differ greatly in different subjects), the history of the patient with respect to precedent lues; the tobacco habits of male patients, and the local treatment instituted bear upon the question of diagnosis. In a few of the cancerous cases, there is transformation of the syphilitic into the epitheliomatous process, the former beginning in early or middle life and the latter only after long continued irritation—in the case of male patients often from the use of tobacco.

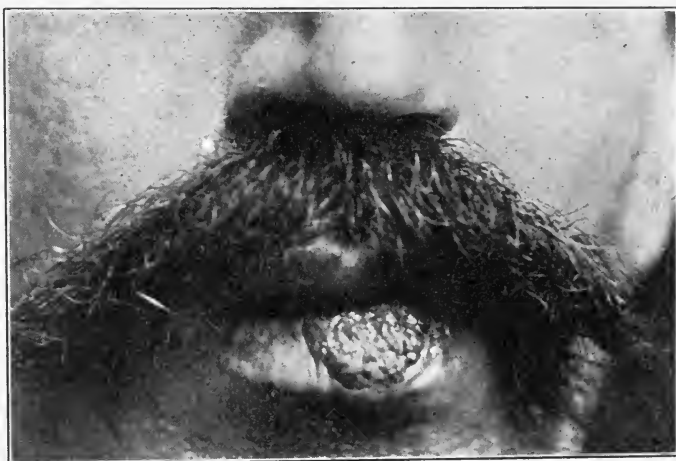
Scurvy (*Scorbutus*).—In addition to the cutaneous symptoms characteristic of scorbutus (hemorrhages into the skin and subcutaneous tissue, purpuric lesions taking on a greenish hue, petechiæ, ulcerations with foul base, ecchymoses) striking phenomena are exhibited in the mouth. The lesions include swelling of the gums, especially around carious teeth, the latter being often sunken beneath a bluish tinted fungoid growth. Ulceration, which is characteristic of the disease, soon follows, spreading along the margin of the gums,

producing a characteristic fetor of the breath and, in severe cases, dehiscence of the teeth and alveolar necrosis.

The most commonly accepted etiology of the disease is that which assumes the presence of a specific toxine. The lesions in the mouth are to be distinguished from purpura hemorrhagica, mercurial cachexia, and acute lymphatic leukæmia.

Prophylaxis is of the greatest value in treatment, including a proper dietary and environment. The local management of the lesions in the mouth is by strict asepsis and stimulation of the fungoid growths about the teeth.¹

FIG. 223.



Blastomycosis of the lip.

Blastomycosis.—We have had under observation one typical case of blastomycosis involving the mucous membrane of the lower lip within the vermilion border on the right side of the median line. The growth was of the size of a large mulberry and resembled that berry in the fact that it was beset here and there over the surface with minute projecting points. The definition of the growth was distinct; it was softish to the touch; and occurred in the case of an adult patient engaged in farming, who at one time had been chewing a quantity of grain in order to test it. In another case seen by us where there were lesions elsewhere than on the lip, a much smaller growth developed on the muco-cutaneous border.

Lepra.—In a large proportion of all cases of tubercular leprosy examined by us characteristic nodules have been recognized on the posterior aspect of the tongue. Similar lesions occur on other mucous membranes than in the mouth as also over the glottis and epiglottis and the trachea. In all these cases recognition of the bacilli of the disease is rendered facile by the abundance of these organisms not only in the mouth but also over the nose.

¹ Osler's Modern Medicine, vol. i., p. 897.

DISORDERS OF THE VULVA AND VAGINA.

Syphilis.—The common lesions of lues in this situation are the initial sclerosis, moist papules exhibited as mucous patches and condylomata; gummata and ulcers, the latter being followed by atrophy and cicatrices. Any or all of these manifestations may occur wholly on the cutaneous surface, or on the mucosa, or occupy both situations. They may develop to an unusual degree here owing to the conditions favorable to their growth. This is especially true with regard to condylomata. The usual site of the initial sclerosis is the labia majora and minora, the vestibule, the meatus urinarius, the clitoris, the fourchette, the os uteri, and, rarely, the point of the superior commissure of the vulva. In these situations their transformation in situ to condylomata, mucous patches, and other secreting lesions of systemic disease is readily effected in consequence of the heat, moisture, and friction to which they are here exposed. The deformities of the genital region, venereal in origin, are commonly of exaggerated type and as a rule, in fetor, in abundance of secretion, and in volume they far exceed the corresponding lesions in the male sex. Inguinal adenopathy is not a characteristic of genital chancres in woman. (Cf. chapter devoted to Syphilis.)

Chancroid.—These lesions occur most commonly on the labia majora and minora, the vestibule, and the mucous membrane of the vagina near the ostium. Perineal chancroids are far more common in women than in men by reason of the readiness with which the auto-inoculable secretion flows over the perineum to the sensitive and readily eroded mucous orifice of the anus. The clinical symptoms are exhibited early as pustules and erosions and later as ulcers and deep abscesses. They may be single, but as a rule, are multiple and vary greatly in size. They are not indurated and are usually accompanied by subjective sensations varying from mild itching to severe pain. Rarely they are complicated by gangrene or phagedena. These lesions are readily auto-inoculable and by extension of the process a serpiginous ulcer may be formed not unlike a late luetic lesion. *Verruca acuminata*, herpetic lesions, and a more or less diffuse inflammation of the skin and mucosa may occur as complications. The important disorders to be differentiated from chancroid are the initial lesion of syphilis and herpes progenitalis.

Verruca Acuminata.—These lesions occur most commonly in women of low social order and among these in extreme development. At times the entire perineal region is occupied by a mass of such lesions which extend over the mucous membrane of the vagina as well as upon the glabrous skin.

Pruritus Vulvæ.—In this disorder changes are induced both in the skin and mucosa by trauma inflicted during the paroxysms of intense itching. The mucosa may show erosions, ulcers, thickened areas, and finally atrophic changes.

Inflammations of the Vulva.—Dermatitis and inflammation of the

mucosa in varying degrees, due to decomposing secretions and acrid discharges, are not uncommon. Diabetic eczema and various superficial and deep pustular infections also occur. Gangrenous inflammation (noma) is seen occasionally in cachetic individuals and, as a sequel to one of the exanthemata, in poorly nourished children.

Tuberculosis Cutis Orificialis is exhibited in this region as miliary tubercles and superficial, ragged, ill-conditioned ulcers associated with internal tuberculosis of this region. Other manifestations of tuberculosis with larger nodules and ulcers occasionally occur.

Dermoid and Sebaceous Cysts are occasionally seen about the vulva, but the most common cystic tumor is the retention cyst of the glands of Bartholin.

Urethral Caruncles are small, bright-red, vascular papillomata situated at the entrance of the urethra and are a source of annoyance from smarting sensations during urination and from hemorrhage.

Lichen Planus may involve the mucosa of this region in association with the disease elsewhere. The lesions are similar to those described on the mucous membranes. (Cf. Lichen Planus of the Mouth.)

Pemphigus Vegetans.—Vesicles, bullæ, and excoriations peculiar to this disorder as it affects mucous membranes occur on the vaginal mucosa.

Elephantiasis.—This term is applied to a hypertrophic growth of the genitals due to chronic inflammatory processes affecting the parts, and is in no way connected with the true elephantiasis of the tropics which is of parasitic origin. The parts most commonly attacked are the clitoris, labia (minora and majora), and at times the perineum. Negresses furnish the greater number of the cases. The disease is due to obstruction of the lymphatic channels which drain the external genital region, the obstruction being caused by changes incident to chronic inflammation of the parts. One or both sides may be affected and the enlargement may be considerable. It is exhibited as a brawny, firmly indurated swelling and may be accompanied by moderate or severe pain. Syphilis is an important factor in etiology. The condition requires surgical measures for its relief.

Carcinoma of the external genitals in woman is most common between the ages of forty-five and sixty years. Early, these new-growths appear as well-defined, hard, flattened, nodular masses with ulcerating centers and everted margins. Later, an infiltration of secondary nodules occurs and the disease spreads to the margin of the mucosa and upwards to the groins. Regional adenopathy occurs comparatively early. Carcinoma of the clitoris is rare and affects usually patients who often are the subjects of vulvar pruritus.

Kraurosis Vulvæ is a condition of the vulva in women affecting particularly the labia minora, preputium clitoridis, and the vestibulum in which there occurs a peculiar shrinking, shrivelling, or atrophic change. The atrophy may be preceded by intense pruritus, burning sensations, or hyperæsthesia. Kraurosis has been developed in patients ranging from nineteen to seventy years. Epithelioma may

supervene, and Perrin states that leucoplasia precedes both the kraurosis and epithelioma. Extirpation surgically is indicated to prevent malignant transformation.

The disorders situated on the mucosa and skin of the penis are: syphilis (the initial lesion, papules exhibited as mucous patches, and condylomata, tubercles, gummata and ulcers), chancroid, balanitis and balano-posthitis, inflammatory phimosis and paraphimosis, gangrene, verruca acuminata, herpes progenitalis, lichen planus, psoriasis, porokeratosis, and epithelioma. It is only necessary here to emphasize the fact that epithelioma, chancre, and gummata are at times mistaken one for the other, that chancre and chancroid may be coexistent, and that herpes progenitalis and mucous patches are at times confused. For complete description of these various disorders, the chapters devoted to their discussion should be consulted.

Affections of the tongue, mouth, and cheeks, not in association with recognized dermatoses, are purposely excluded from this chapter. For a description of this group of disorders, some rare of occurrence and of indeterminate character, others more common and of recognized etiology, the reader is referred to the treatises specially devoted to this subject. Among these affections may be named the "geographical tongue," the grooved, wrinkled, sulcated, cleft, and otherwise altered tongue usually occurring in childhood and probably due to congenital deformity; the "black," hairy, or hyperkeratotic tongue, in which hair-like filaments usually of blackish hue become visible in the region anterior to the circumvallate papillæ; the ringworm-like patches of the tongue (*pityriasis lingua*, *glossitis areata exfoliativa*) in which small, grayish or reddish, circumscribed, slightly elevated patches appear on the dorsum of the tongue commonly benign in character and at times certainly due to grinding of the teeth in children during the hours of sleep; the papillomata of the tongue, inner faces of the cheeks, and lips, occurring in both sexes and at all ages; the "tied tongue," angiokeratomata of the tongue, falsely so called; the macroglossia of surgical authors, the odd-looking secreting papules of the gums, chin, and sub-mental region, due to fistulous sinuses connected with the base of carious teeth; and the entire group of changes in the mouth and throat due to the presence of adenoids.

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